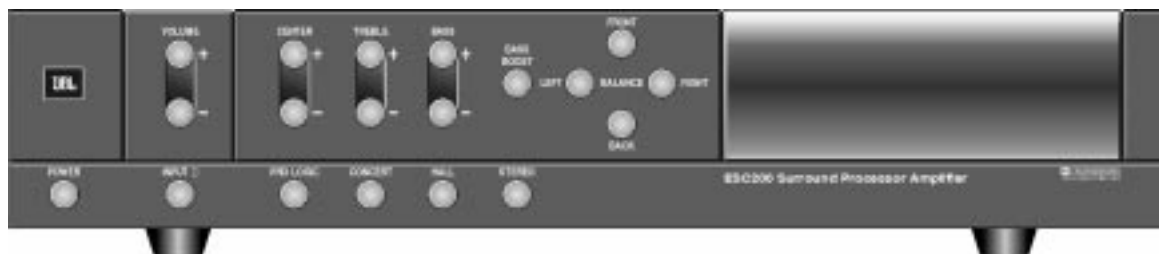




# ESC200

Dolby Pro-Logic® Surround  
Processor/Amplifier

## SERVICE MANUAL



JBL Consumer Products Inc.  
250 Crossways Park Drive  
Woodbury, N.Y. 11797  
1-800-336-4JBL in the USA

**H** A Harman International Company

Part No.: 1112-ESC200 Rev A 10/98

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## ESC200 SPECIFICATIONS

	<b>Satellite Speaker</b>	<b>Subwoofer</b>
Power Handling (RMS) . . . . .	20 Watts . . . . .	60 Watts
Frequency Response . . . . .	120Hz - 20kHz . . . . .	35Hz - 200Hz
Sensitivity (1 Watt/1 meter) . . . . .	87dB. . . . .	90dB
Nominal Impedance. . . . .	8 ohms. . . . .	6 ohms
Woofer Size . . . . .	3" . . . . .	6-1/2"
Tweeter Size. . . . .	1"	
Dimensions (HxWxD) . . . . .	4-1/16 x 7-1/2 x 7-3/8" . . . . .	7-3/4 x 13-7/8 x 17-3/4"
	103 x 190 x 187mm	198 x 354 x 451mm

### Processor Amplifier

Total Maximum Amplifier Output - 100 Watts

Dimensions (HxWxD) - 2-11/16 x 13-1/2 x 9" (69 x 343 x 230mm)

Occasional refinements may be made to existing products without notice, but will always meet or exceed original specifications unless otherwise stated.

## ESC200 SPECIFICATIONS

### ESC200 Pro-Logic Surround Theater System

Power source: 117V/60Hz 230Hz/50Hz

Test conditions: 8 ohm loading each channel (6X)

**Bass & Treble** - flat

**Boost** - off

**Mode** - stereo

**Fader** - front channel = back channel

**Balance** - left = right

**Volume** - 300 mV input for 1W (to nearest step)

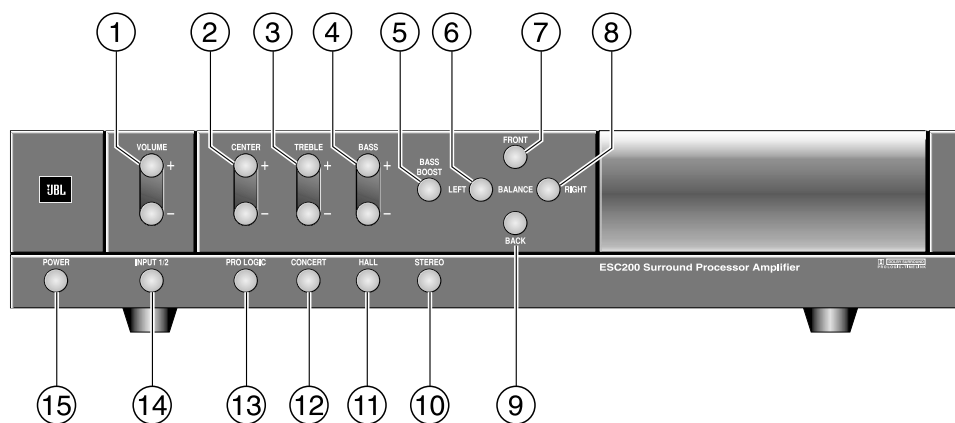
**Center Trim** - center

**Surround Trim** - center

### Technical Performance Readings

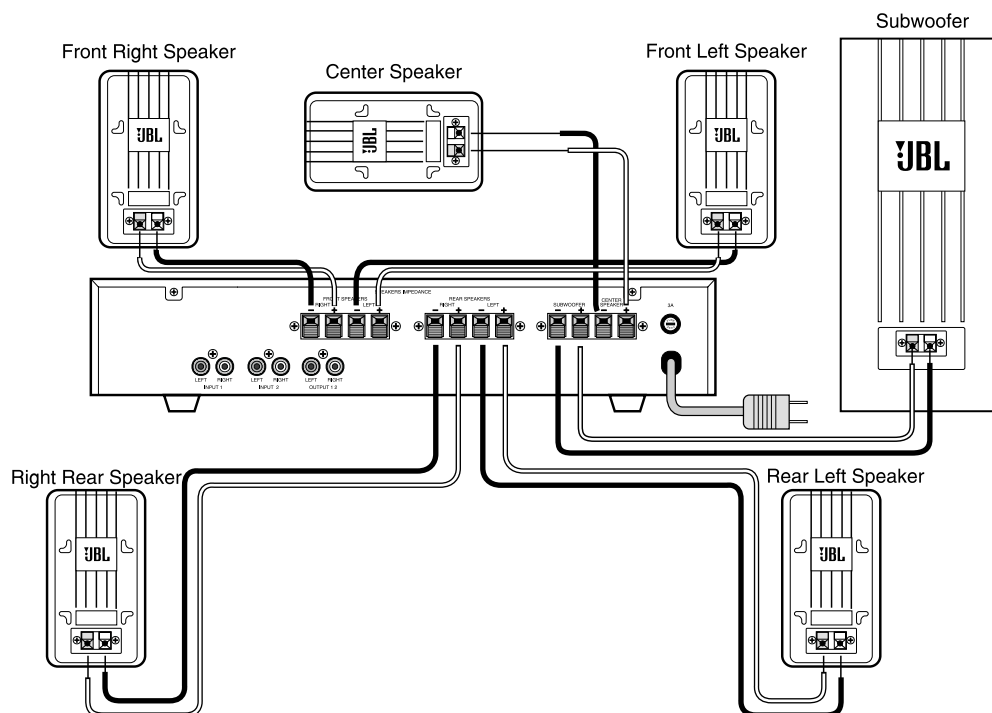
Parameters	Unit	Typical	Limit
1. THD at 8W, 1KHz, output	%	0.5%	1%
2. THD at 15W, 50Hz, Sub out	%	1.0%	3%
3. Frequency Response at five output re 1KHz, -3dB	Hz	125	100-150
a.	Hz	50K	>30K
4. Frequency Response at five output re 50Hz, -3dB	Hz	110	85-125
a.	Hz	18	<25
5. Volume Control at 1KHz (from Max)	db	60	>50
6. Balance Control at 1KHz	db	40	>30
7. Fader Control at 1KHz	db	40	>30
8. Bass a. Boost at 100Hz	db	7	>5
b. Cut at 100Hz (Bass control)	db	10	>8
9. Treble a. Boost at 10KHz	db	8	>6
b. Cut at 10KHz (Treble control)	db	8	>6
10. Bass Boost at 80Hz (Boost function)	db	6	>5
11. Input Z at 1KHz a. Input 1	ohm	20K	>15K
b. Input 2	ohm	20K	>15K
12. S/N Ratio "A" re 1W input short	db	72	>70
13. Noise level w/30K LPF input short	mV	0.8	1.0
14. S/N Ratio "A" re 1W Surround Mode L, C, R, SUB	db	70	>65
Input Short Surround	db	63	>60
15. Noise level w/30K LPF Surround Mode L, C, R, SUB	mV	1.2	1.5
Input Short Surround	mV	1.5	2.0
16. Input Sensitivity at 8W (Vol at Max, 1kHz) at FL, FR, RL, RR, A. RCA	mV	350	270-420
17. Separation at 1W, 1kHz	db	45	>40

## CONTROLS AND THEIR FUNCTION

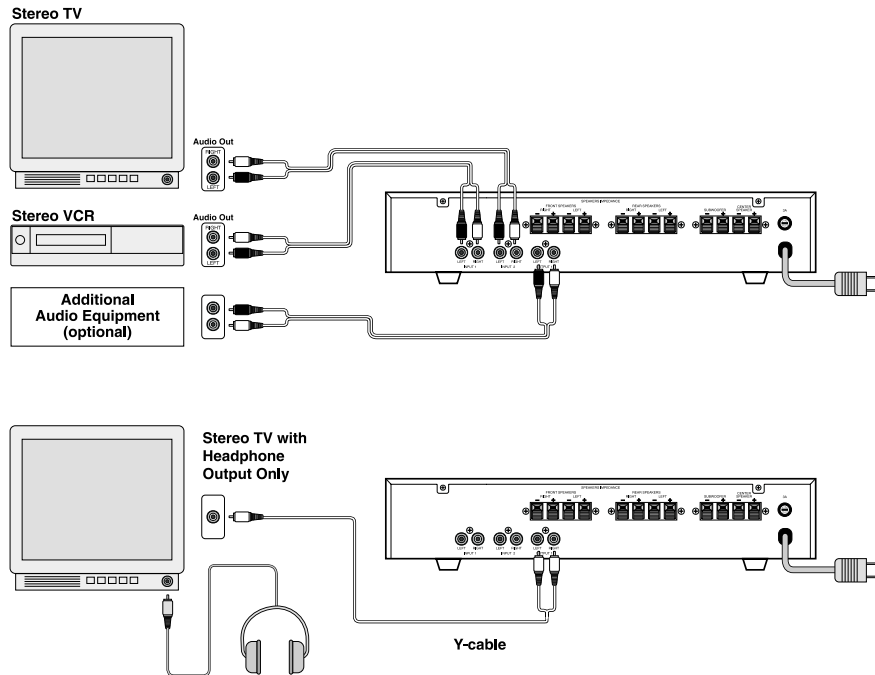


1. **VOLUME** - This controls an increase (+) or decrease (-) in volume.
2. **CENTER** - This controls the volume of the Center Speaker.
3. **TREBLE** - This controls the level of the treble.
4. **BASS** - This controls the overall bass output.
5. **BASS BOOST** - This increases the bass output to the subwoofer.
- 6-9. **BALANCE** - These buttons balance the front and rear as well as the left and right speaker strengths.
10. **STEREO** - This turns on and off the stereo mode.
11. **HALL** - This changes the sound to Hall mode.
12. **CONCERT** - This changes the sound to Concert mode.
13. **PRO-LOGIC** - This turns on the Pro-Logic mode.
14. **INPUT 1/2** - This switches to either music source connected to Input 1 or Input 2 (RCA jacks).
15. **POWER** - This button turns on the ESC200.

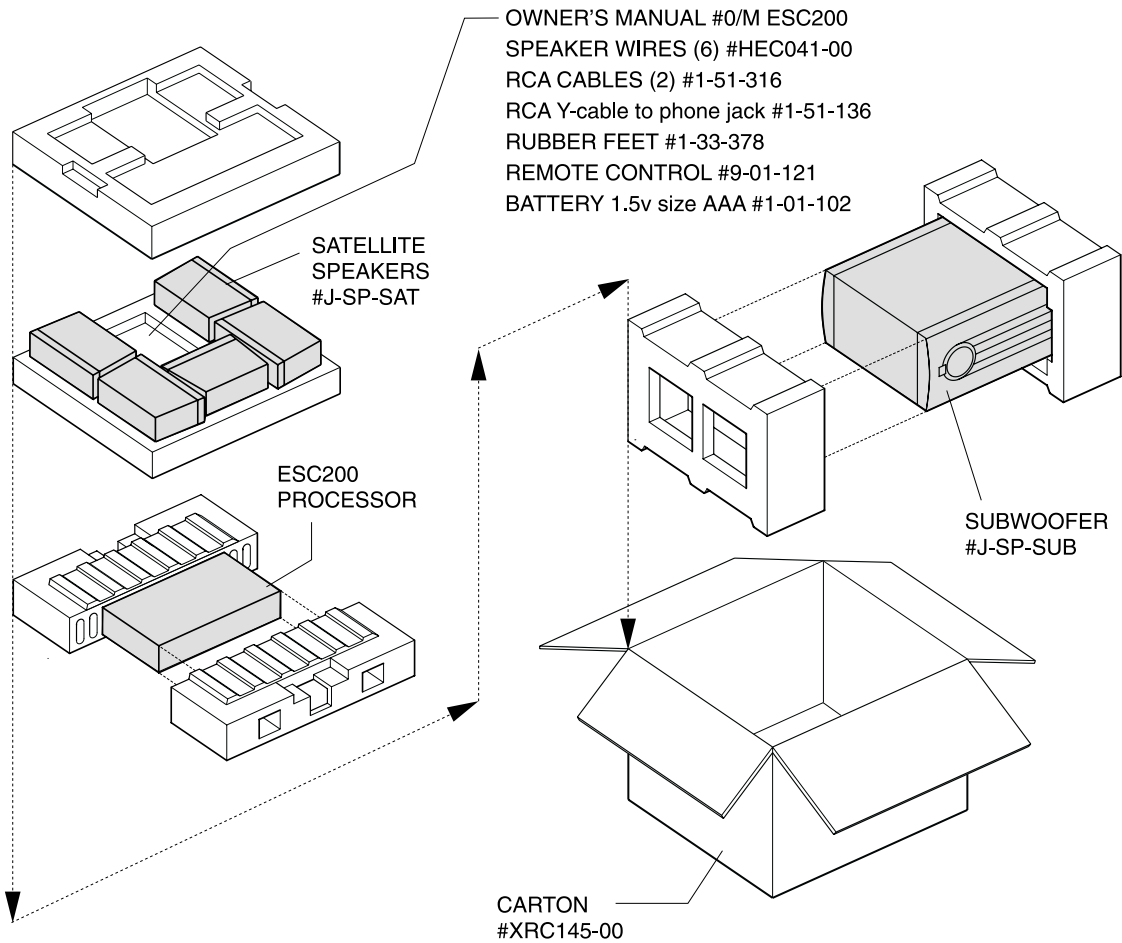
## ESC200 SPEAKER AND SOURCE CONNECTIONS



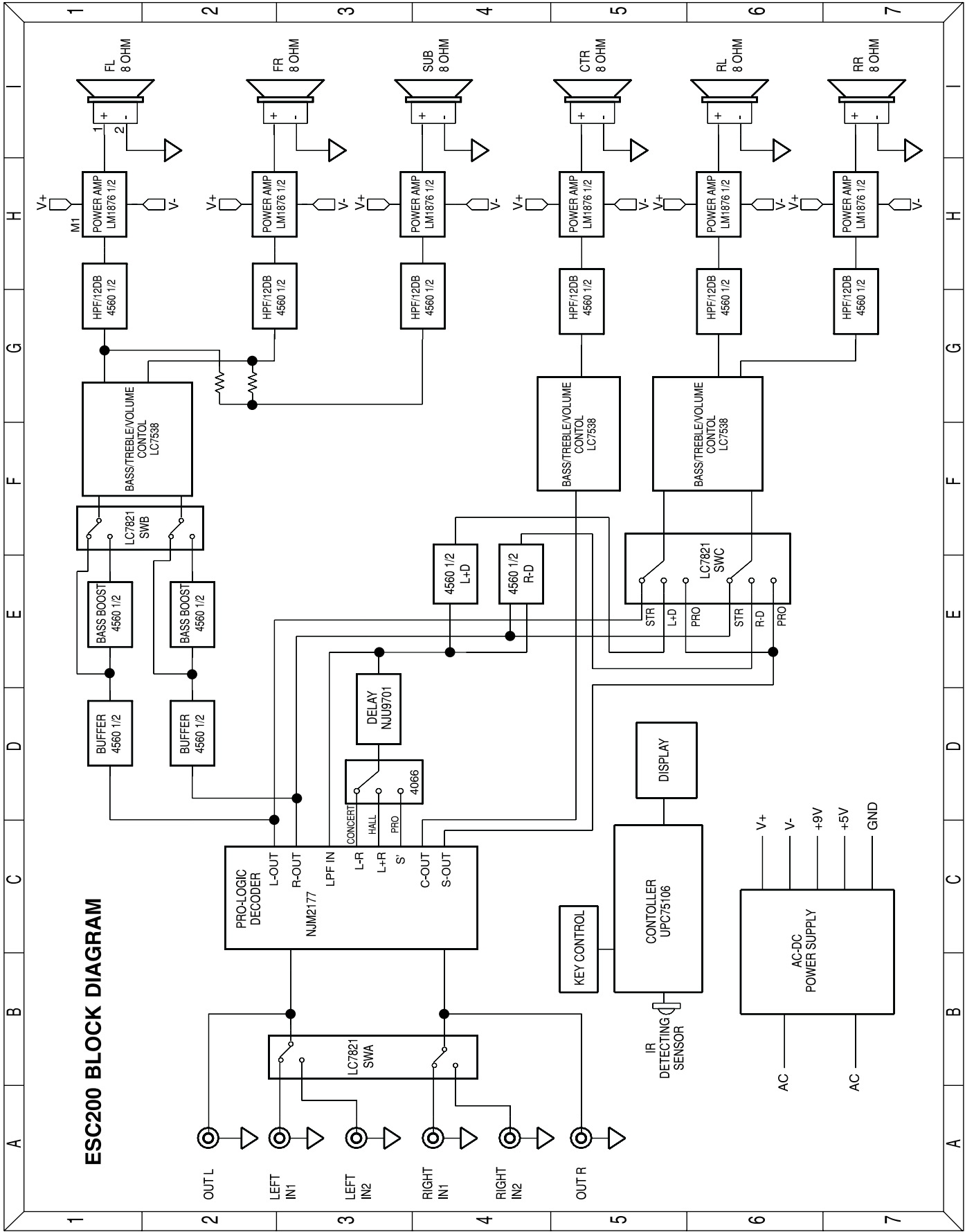




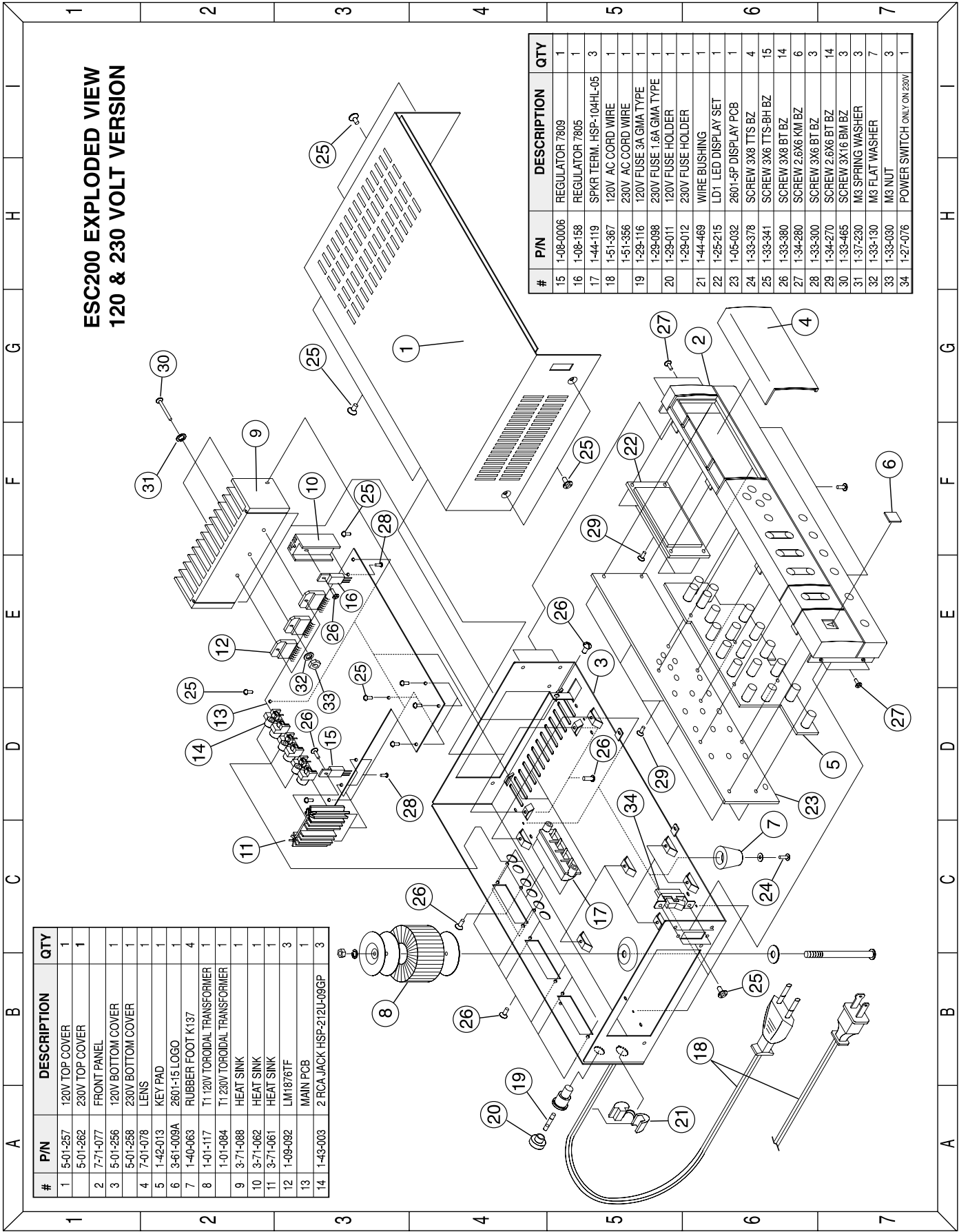
## ESC200 PACKING



ESC200 BLOCK DIAGRAM



ESC200 UNIT EXPLODED VIEW



## ESC200 PARTS LISTS

Ref. #	Part #	Description	Qty	Ref. #	Part #	Description	Qty
<b>MAIN-PCB SECTION</b>				C56	1-12147LI	47μF 16V+-20% 5x11	1
<b>Capacitors</b>				C59, 143	1-12210KI	100μF 10V+-20% 5x11	2
C1, 2, 35, 60, 86, 158, 179	1-12010PI	1μF E.CAP, 50V+-20% 5x11	7	C63, 141	1-12247MI	470μF 25V+-20% 8x16	2
C3	1-12310KI	1000μF 10V+-20% 8x16	1	C90, 91	1-16110PH	100pF 50V+- 10%	2
C5, 199, 202, 205 208, 211, 214	1-11447RH	0.0047μF 100V+-10% MINI	7	C109, 119, 120, 127, 128, 133	1-12133NI	33μF 35V+-20% 6x11	6
C6, 11, 21, 24, 25 97, 102, 118, 126, 154	1-11122RH	0.22μF 100V+-10%MINI	10	C139, 148, 149, 172	1-12524MI	2200μF 25V+-20% 16x26 85C	4
C7, 48, 73, 77, 144, 153, 165	1-11322RH	0.022μF 100V+-10% MINI	7	C177, 186, 187, 188, 189, 190, 197	1-11201RH	0.01μF 100V+-10% MINI	7
C8, C27, C31, C54, C55	1-11347RH	0.047μF 100V+-10% MINI	5	C181	1-12922PI	22μF 50V+-20% 5x11 LL	1
C9, 41, 43, 61, 104, 178, 180	1-14091PI	0.1μF MONO CAP 50V +-20% HB-TYPE	7	C191, 192, 193, 194, 195	1-16115PH	150pF 50V +-10% CERAMIC	5
C10, 12	1-12122LI	22μF 16V+-20% 5x11	2	C198, 201, 204, 207, 210, 213	1-16122PH	220pF 50V +-10% CERAMIC	6
C11, 39, 44, 45 47, 62, 64, 66, 69, 70, 72, 88, 89, 94, 98, 99, 103, 107, 115, 123, 137, 140, 161, 162, 164, 171	1-12110LI	10μF 16V+-20% 5x11	26	C200, 203, 206, 209 212, 215, 216	1-16301PH	0.001μF 50V +-10% CERAMIC	7
C13, 14, 16, 17 20, 32, 33, 40, 53, 57, 80, 81, 82, 83, 84, 92, 93, 105, 106, 113, 114, 121, 122, 129, 130, 150, 156, 182, 183, 184, 185, 219, 220	1-11101RH	0.1μF M.CAP, 100V+-10% MINI	33	C221	1-16010PH	10pF 50V +-10% CERAMIC	1
C15, 67, 75, 79, 95, 96, 100, 108, 111, 116, 117, 124, 125, 132, 136, 138, 147, 160, 167, 169	1-12020PI	2.2μF 50V+-20% 5x11	20	<b>Diodes</b>			
C18, 19, 37, 38, 101	1-12047PI	4.7μF 50V+-20% 5x11	5	D1, 2, 3, 4	1-05-031	DIODE 6A1-4	4
C22	1-12968PI	0.68μF 50V+-20% 5x11 LL	1	D5	1-05-009	DIODE 1N4148 T/R	1
C23, 58, 87	1-16147PH	470pF 50V+-10%	3	Z1, 2	1-06-001	ZENER 1/2W+-5% 5.1V T/R	2
C26	1-11439RH	0.0039μF 100V+-10% MINI	1	Z3	1-06-003	ZENER, 1/2W+-5% 8.2V T/R	1
C28, 42	1-12220KI	220μF 10V+-20% 6x11	2	<b>Integrated Circuits</b>			
C29, 154, 155	1-11456RH	0.0056μF 100V+-10% MINI	3	U1	1-09-058	IC, NJM2177AL, DOLBY PRO-LOGIC 1 SURROUND DECODER	1
C30	1-12002PI	0.22μF 50V+-20% 5x11	1	U2	1-09-057	NJU9701D/NJU9702D DIGITAL DELAY	1
C36, 145	1-16168PH	680pF 50V+-10%	2	U3	1-09-305	CD 4066D QUAD BILATERAL SWITCH	1
C49, 74, 78, 152, 157, 166	1-11433RH	0.0033μF 100V+-10% MINI	6	U4	1-09-024	BA14741 ROHM QUAD OP AMP	1
C50, 51	1-16031PH	30pF C.CAP, 50V+-10% NPO	2	U5, 10, 11, 12	1-09-421	BA4560/4560D ROHM/NJRC DUAL OP AMP	4
C52, 63, 141, 142, 146	1-12247KI	470μF 10V+-20% 8x12	5	U6, 7, 8	1-09-054	LC7538NM SANYO, ELECTRONIC VOLUME CONTROL	3
				U9	1-09-053	LC7821N SANYO, ANALOG SWITCH	1
				U13, 14, 15	1-09-092	LM1876TF NS, 20W POWER AMP	3
				U16	1-08-006	REG, NJM7809FA/7809A +9V REGULATOR	1
				U17	1-08-158	REG, NJM7805FA/7805A +5V REGULATOR	1
				<b>Resistors</b>			
				R1, 2, 23, 27, 30, 46, 47, 77, 79	1-17-415	1/8W+-5% PS 15K OHM T/B	9
				R3, 4, 9, 10, 29, 35, 96, 104, 105, 120, 121, 122	1-17-482	1/8W+-5% PS 100K OHM T/B	12
				R5, 6, 12, 25, 39, 54, 57, 67, 80, 90, 108, 109, 111, 113, 123, 124, 125, 126, 164, 165, 166, 170	1-17-410	1/8W+-5% PS 10K OHM T/B	22

Ref. #	Part #	Description	Qty
R7, 8	1-17-510	1/8W+-5% PF 100K OHM	2
R11	1-17-439	1/8W+-5% PS 39K OHM T/B	1
R15, 99	1-22-127	3W+-5% WIRE WOUND 27 OHM	2
R16, 102	1-17-412	1/8W+-5% PS 12K OHM T/B	2
R17, 74	1-17-382	1/8W +-5% PS 8.2K OHM T/B	2
R18, 78, 101, 110	1-17-422	1/8W+-5% PS 22K OHM T/B	4
R19, 51, 87, 92	1-17-327	1/8W+-5% PS 2.7K OHM T/B	4
R20	1-17-420	1/8W+-5% PS 20K OHM T/B	1
R21, 24, 69	1-17-375	1/8W +-5% PS 7.5K OHM T/B	3
R22, 26	1-17-447	1/8W+-5% PS 47K OHM T/B	2
R28	1-17-647	1/8W+-5% PS 4.7M OHM T/B	1
R31, 33, 162, 163, 167, 168, 169, 171	1-17-351	1/8W +-5% PS 5.1K OHM T/B	8
R32, 34	1-17-510	1/8W+-5% PS 82K OHM T/B	2
R36	1-17-610	1/8W+-5% PS 1M OHM T/B	1
R37, 55, 65, 88, 103	1-17-324	1/8w+-5% PS 2.4K OHM T/B	5
R38, 56, 66, 75 76, 89, 100	1-17-430	1/8W+-5% PS 30K OHM T/B	7
R40, 63	1-17-418	1/8W+-5% PS 18K OHM T/B	2
R41, 45, 52, 59, 64, 68, 73, 82, 86, 91, 97, 175	1-17-515	1/8W+-5% PS 150K OHM T/B	12
R42, 49, 60, 70, 83, 93	1-19-010	1/2W+-5% PS 1 OHM T/B	6
R43, 50, 61, 71, 84, 94, 98	1-19-110	1/2W+-5% PS 10 OHM T/B	7
R44, 62, 72	1-17-356	1/8W +-5% PS 5.6K OHM T/B	3
R48, 95	1-17-339	1/8W +-5% PS 3.9K OHM T/B	2
R53, 58	1-17-120	RES, 1/8W+-5% PS 20 OHM T/B	2
R85, 112	1-17-215	1/8W+-5% PS 150 OHM T/B	2
R106, 107	1-17-312	1/8W+-5% PS 1.2K OHM T/B	2
R114, 115, 116, 117	1-17-310	1/8W+-5% PS 1K OHM T/B	4
R118, 119	1-17-351	1/8W+-5% PF 5.1K OHM	2
R127	1-17-310	1/8W+-5% PF 1K OHM	1
R128	1-17-433	1/8W+-5% PS 33K OHM T/B	1
R155	1-17-533	1/8W+-5% PS 330K OHM T/B	1
R172, 173	1-17-410	1/8W+-5% PF 10K OHM	2
<b>Transistors</b>			
Q15, 16, 17, 18	1-07-004	NPN NEC 9014C	4
Q19	1-07-107	NPN MPSA06	1

Ref. #	Part #	Description	Qty
<b>MISCELLANEOUS SECTION</b>			
L1, 2, 3, 4, 5, 6	1-04-011	COIL, SPRING COIL 0.8mm 12T D=5.5mm	6
LD1	1-25-215	LED DISPLAY SET	1
XTAL1	1-03-109	C-RES, CER-RESONATOR, CSA2.0MHZ MURATA	1
		FLAT CABLE PITCH=2mm UL 3 PINS 160MM(10+10)	1
	1-58-017	WAFER, 12 PINS PITCH=2.5mm	1
	1-58-010	WAFER, 3 PINS PITCH=2.5mm	1
	1-58-009	WAFER, 4 PINS PITCH=2.5mm	1
		FLAT CABLE PITCH=2.54mm 16 PINS 60MM(10+3) HOUSING FEMALE/MALE HOUSING P=2.5mm	1
	1-51-372	SET, 12PINS 100mm FEMALE/MALE	1
	1-51-373	SET, 4PINS 200mm FEMALE/MALE	1
	1-51-374	SET, 3PINS 160mm FEMALE/MALE	1
	9-01-122	PCB, 2601-5P UL94V0 SWITCH PCB (230V)	1

**KEY PCB SECTION**

C34	1-12110LI	E.CAP, 16V +-20% 5x11 10UF	1
C168, 173	1-12220KI	10V +-20% 6x11 220UF	2
C174	1-12247KI	10V +-20% 8x12 470UF	1
C175, 176	1-16031PH	C.CAP, 50V+-10% 30PF NPO	2
PD1	1-05-039	PHOTO MODULE TSOP1838	1
R130, 132, 134, 136, 138, 140, 142, 144, 150	1-17-147	RES, 1/8W+-5% PS 47 OHM T/B	9
R147, 148	1-17-247	1/8W +-5% PS 470 OHM T/B	2
R153, 174	1-17-310	1/8W +-5% PS 1K OHM T/B	2
R151	1-17-351	1/8W +-5% PS 5.1K OHM T/B	1
R129, 131, 133, 135, 137, 139, 141, 143, 156, 157, 158, 159, 160	1-17-410	1/8W +-5% PS 10K OHM T/B	13
R161	1-17-447	1/8W +-5% PS 47K OHM T/B	1
R154	1-17-610	1/8W +-5% PS 1M OHM T/B	1
R152	1-17-147	1/8W +-5% PF 47 OHM	1
R145, 146, 149	1-17-247	1/8W +-5% PF 470 OHM	3
Q1, 2, 3, 4, 5, 6, 7, 8	1-07-003	NPN NEC 9013H	8
Q9, 10, 11, 12, 13	1-07-002	PNP NEC 9012H	5

Ref. #	Part #	Description	Qty	Ref. #	Part #	Description	Qty
Q14	1-07-001	NPN NEC 9011G	1	30	1-33-465	SCREW 3x16 PM BZ FOR IC BRACKET	3
U18	1-09-056A	IC, UPD75106CW-240 NEC -2552B MICROPROCESSOR	1	31	1-37-230	M3 SPRING WASHER ZNC	3
XTAL2	1-03-107	CER-RESONATOR, CSA4.19MHZ MURATA	1	32	1-37-130	M3 FLAT WASHER BZ	7
				33	1-37-030	M3 NUT	3
				34	1-27-076	POWER SWITCH (ONLY ON 230V)	1

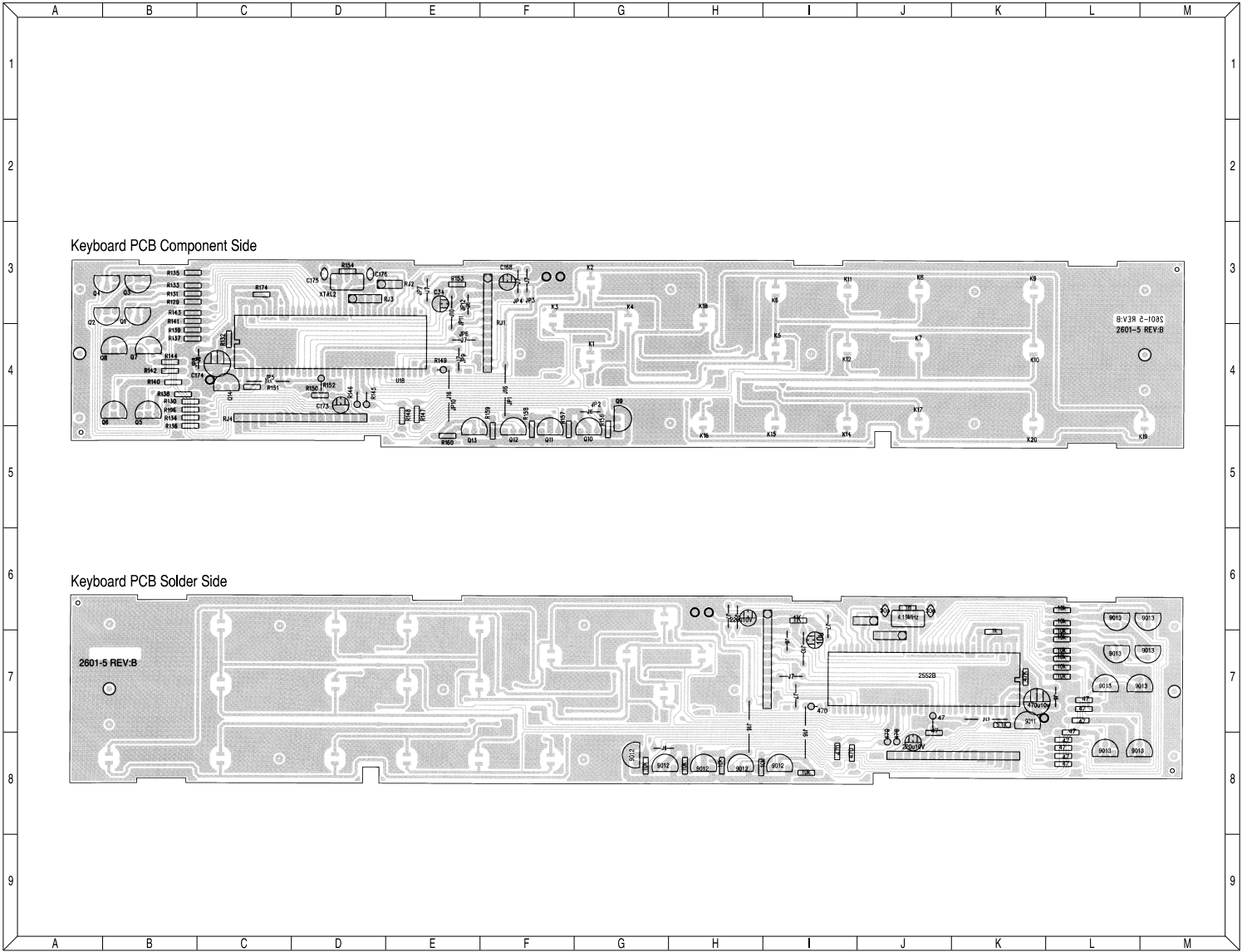
## MECHANICAL PARTS LIST

1	5-01-257 5-01-262	120V TOP COVER 230V TOP COVER	1 1
2	7-71-077	FRONT PANEL	1
3	5-01-256 5-01-258	120V BOTTOM COVER 230V BOTTOM COVER	1 1
4	7-01-078	LENS ACRYLIC	1
5	1-42-013	KEYPAD FOR PANEL	1
6	3-61-009A	LOGO BADGE	1
7	1-40-063	RUBBER FOOT K137	4
8	1-01-117 1-01-084	T1 120V TOROIDAL TRANS. T1 230V TOROIDAL TRANS.	1 1
9	3-71-088	HEAT SINK	1
10	3-71-062	HEAT SINK FOR 7805	1
11	3-71-061	HEAT SINK FOR 7809	1
12	1-09-092	LM1876TF	3
13		MAIN PCB	1
14	1-43-003	2 RCA JACK HSP-212V-09 GP	3
15	1-08-0006	REGULATOR 7809	1
16	1-08-158	REGULATOR 7805	1
17	1-44-119	SPEAKER TERMINAL HSP-104HL-05	3
18	1-51-367 1-51-356	120V AC CORD 230V AC CORD	1 1
19	1-29-116 1-29-098	120V FUSE 3A GMA TYPE 230V FUSE 1.6A GMA TYPE	1 1
20	1-29-011 1-29-012	120V FUSE HOLDER 230V FUSE HOLDER	1 1
21	1-44-469	WIRE BUSHING	1
22	1-25-215	LD1 LED DISPLAY SET	1
23	1-05-032	2601-5P DISPLAY PCB	1
24	1-33-378	SCREW 3x8 TTS BZ FOR THE RUBBER FEET	4
25	1-33-341	SCREW 3x6 TTS-BH BZ FOR PCB & COVER	13
26	1-33-380	SCREW 3x8 BT BZ FOR RCA JACK & HEATSINK	14
27	1-34-280	SCREW 2.6x6 KM BZ FOR KEY PCB	6
28	1-33-300	SCREW 3x6 BT BZ -7809 HEATSINK	3
29	1-34-270	SCREW 2.6x6 BT BZ FOR DISPLAY	13

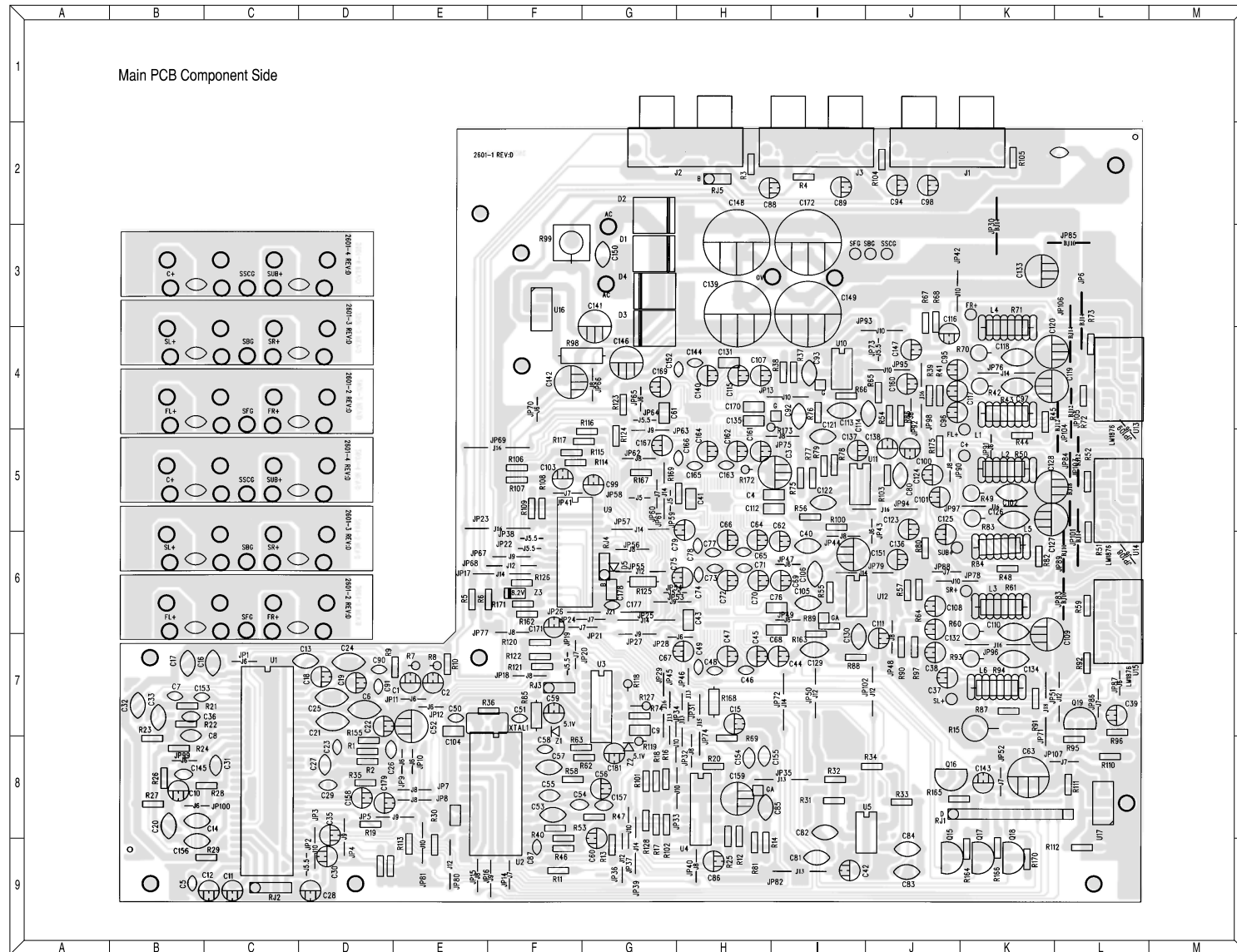
## PACKING SECTION

BATTERY	1-01-102	BATTERY GP24G 1.5V SIZE AAA ZINC CHLORIDE BATT. PACKAGE 2 IN 1	2
RCA Y-CABLE	1-51-136	WIRE, 2 RCA PHONE PLUG RED(R)/BLK(L) PLUG, +3.5mm STEREO PLUG/BLK, WITH 2MT 2C100121/2C28012SX2652P BLK SPIRAL SHIELD WIRE	1
RCA CABLE	1-51-316	WIRE, 1MT 100121/28012SSX2652P BLK PLUG, SPIRAL SHIELD WIRE RCA PHONE PLUG NICKLE-PLATED RED/BLK BOTH END	2
WIRES	HEC041-00	SPEAKER WIRES	6
OWNER'S MANUAL	0/M ESC200	ESC200 MANUAL	1
REMOTE	9-01-121	REMOTE CONTROL	1
FEET	1-33-378	RUBBER FEET	4
SATELLITES	J-SP-SAT	ESC200 SATELLITE SPEAKERS	5
SUBWOOFER	J-SP-SUB	ESC200 SUBWOOFER	1
CARTON	XRC145-00	DISPLAY CARTON	1

ESC200 KEYPAD PCB

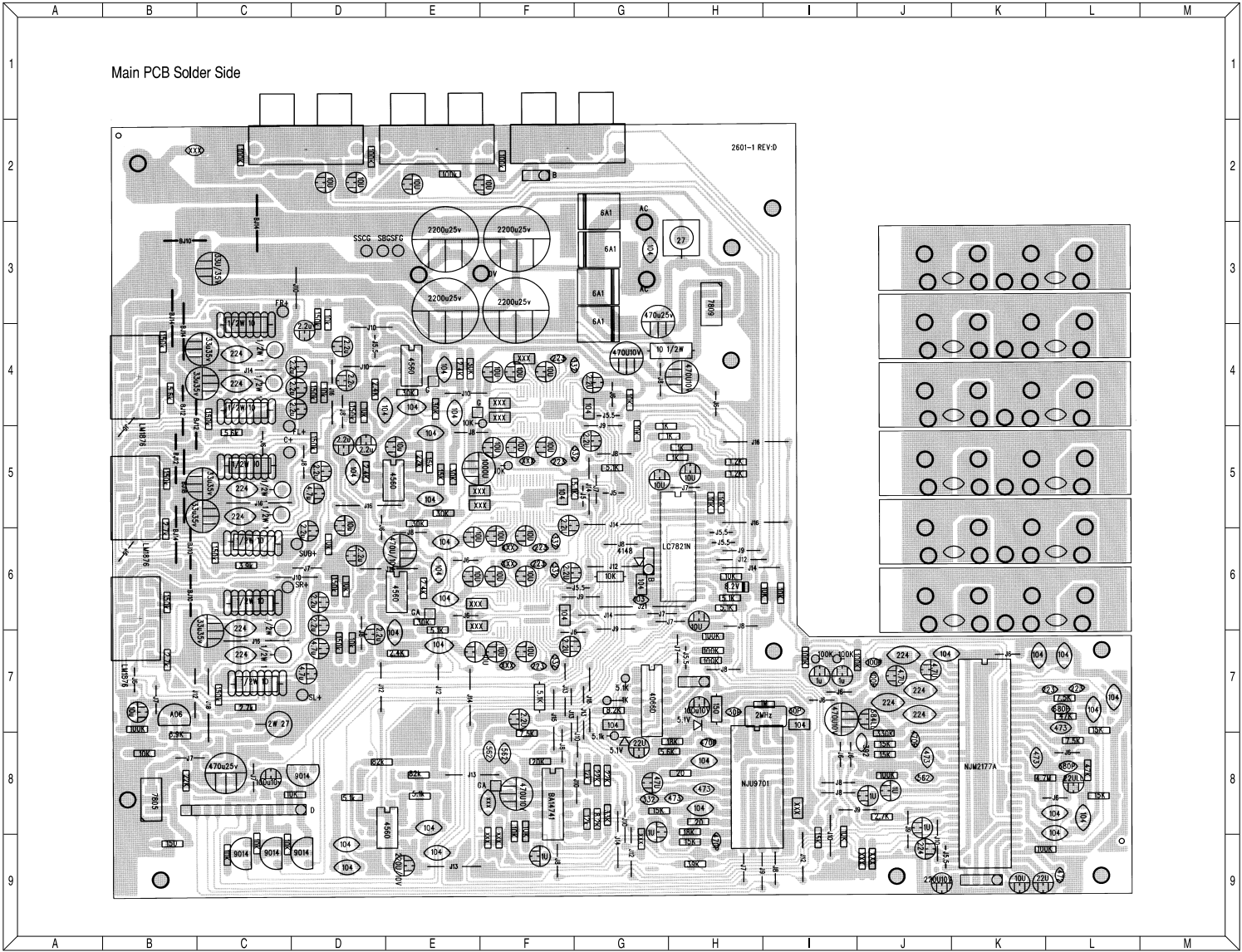


## ESC200 MAIN PCB (Component Side)



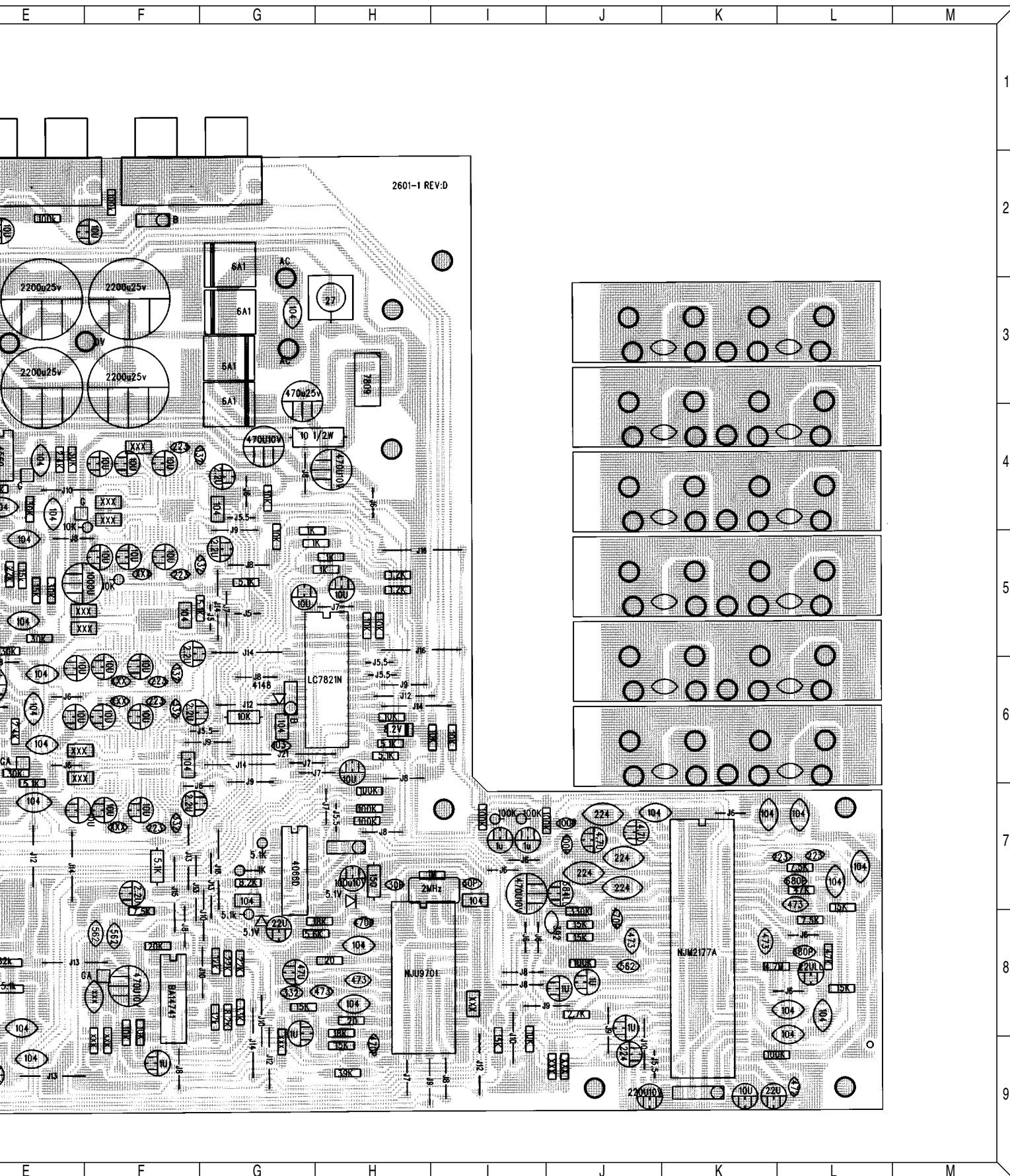


ESC200 MAIN PCB (Solder Side)

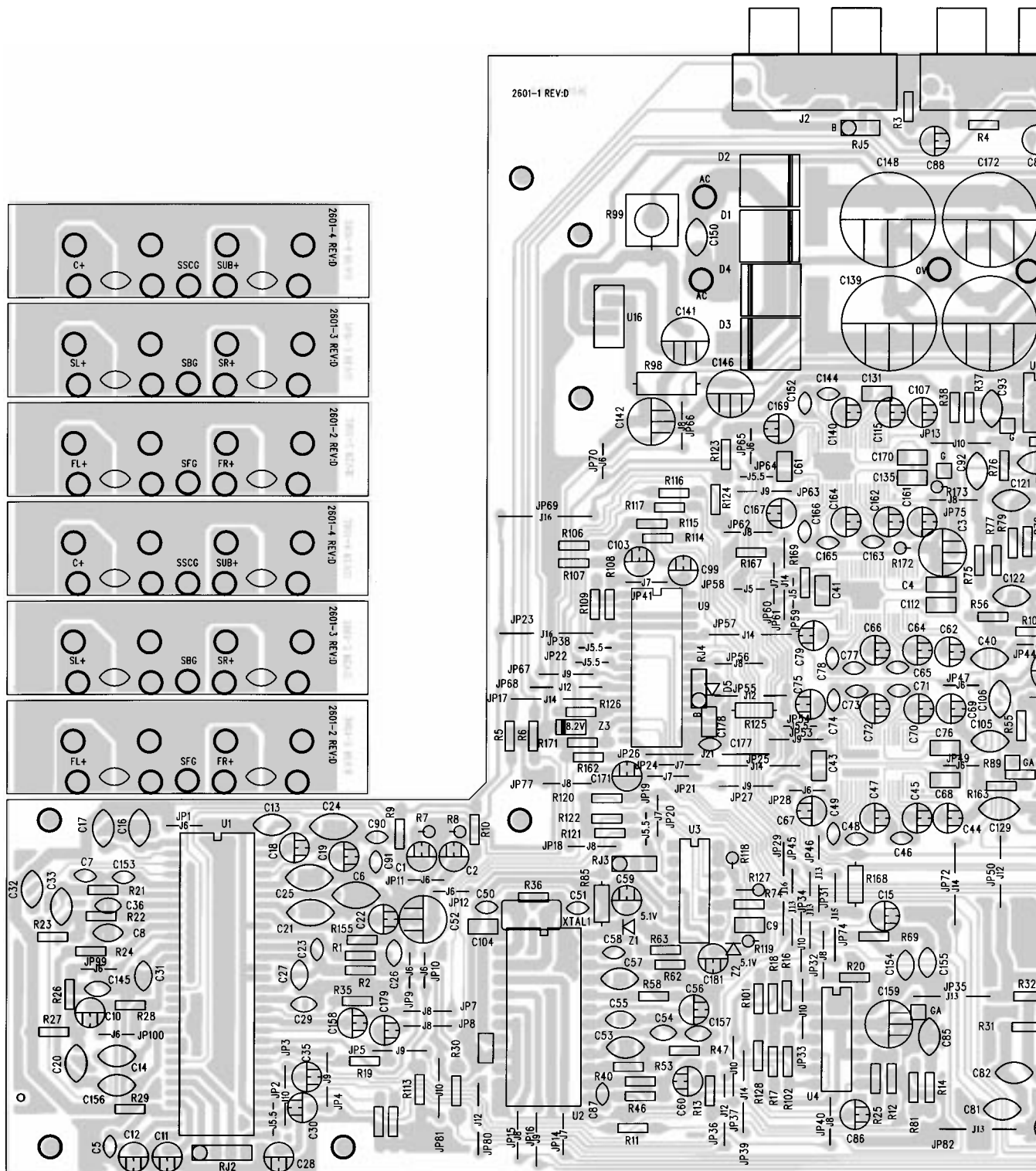


This is a detailed PCB layout diagram showing component placement, dimensions, and part numbers. Key features include:

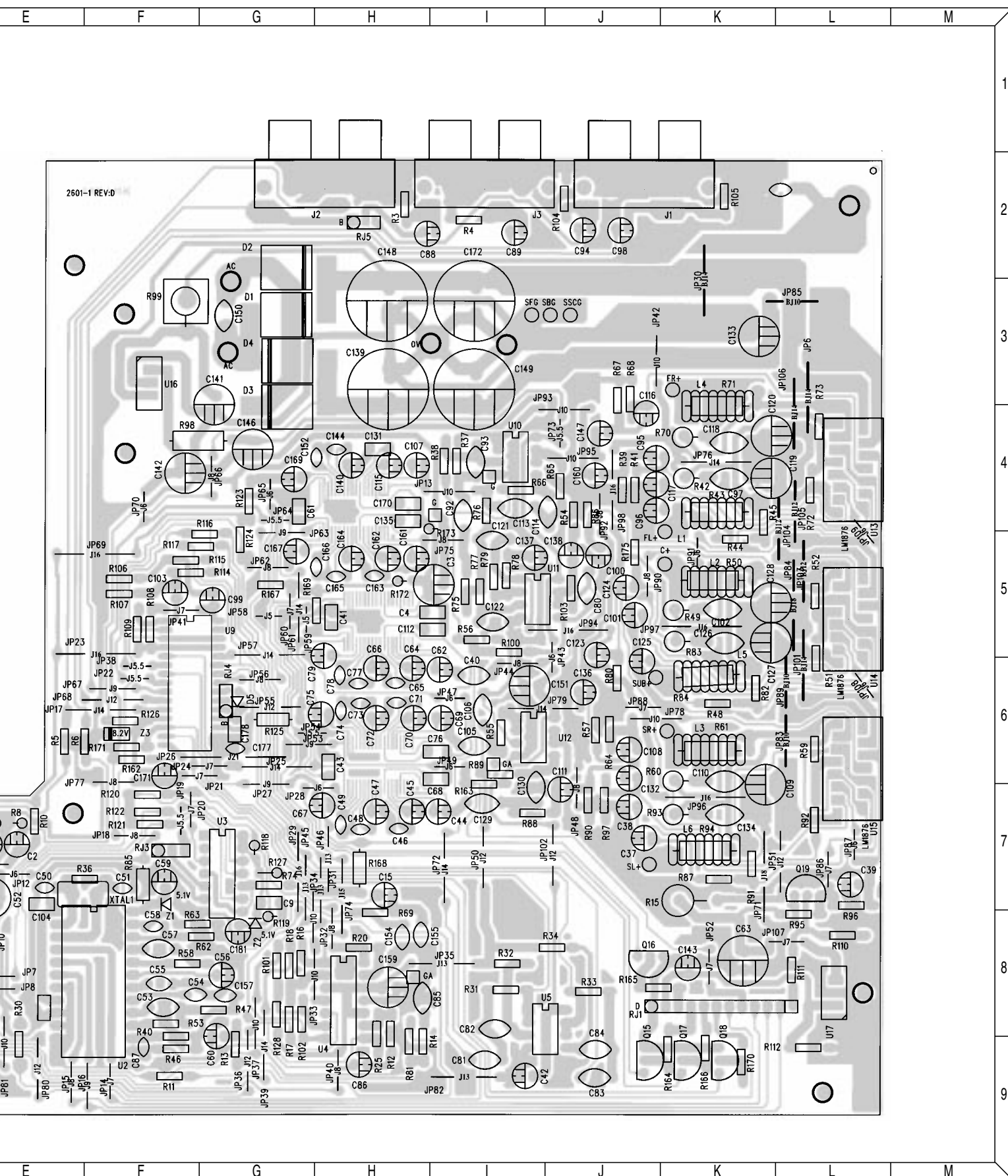
- Dimensions:** Various measurements such as 1.00, .50, .25, .125, .0625, .03125, .015625, .0078125, .00390625, .001953125, .0009765625, .00048828125, .000244140625, .0001220703125, .00006103515625, .000030517578125, .0000152587890625, .00000762939453125, .000003814697265625, .0000019073486328125, .00000095367431640625, .000000476837158203125, .0000002384185791015625, .00000011920928955078125, .000000059604644775390625, .0000000298023223876953125, .00000001490116119384765625, .000000007450580596923828125, .0000000037252902984619140625, .00000000186264514923095703125, .000000000931322574615478515625, .0000000004656612873077392578125, .00000000023283064365386962890625, .000000000116415321826934814453125, .0000000000582076609134674072265625, .00000000002910383045673370361328125, .000000000014551915228366851806640625, .0000000000072759576141834259033203125, .00000000000363797880709171295166015625, .000000000001818989403545856475830078125, .0000000000009094947017729282379150390625, .00000000000045474735088646411895751953125, .000000000000227373675443232059478759765625, .0000000000001136868377216160297393798828125, .00000000000005684341886080801486968994140625, .00000000000002842170943040400743484497072265625, .000000000000014210854715202003717422485361328125, .0000000000000071054273576010018587112426806640625, .00000000000000355271367880050092935562134033203125, .000000000000001776356839400250464677810670166015625, .000000000000000888178419700125232338905335078125, .0000000000000004440892098500626161694526675390625, .00000000000000022204460492503130808472633376953125, .000000000000000111022302462515654042363166884765625, .0000000000000000555111512312578270211815834423828125, .00000000000000002775557561562891351059079172119140625, .00000000000000001387778780781445675529539586059765625, .000000000000000006938893903907228377647697930298828125, .0000000000000000034694469519536141888238489651494140625, .0000000000000000017347234759768070944119244825747072265625, .00000000000000000086736173798840354720596224128735361328125, .000000000000000000433680868994201773602981120643676806640625, .0000000000000000002168404344971008868014905603218384033203125, .00000000000000000010842021724855044340074528016091920166015625, .00000000000000000005421010862427522170037264008045960078125, .000000000000000000027105054312137610850186320040229800390625, .0000000000000000000135525271560688054250931600201149001953125, .00000000000000000000677626357803440271254658001005745009765625, .000000000000000000003388131789017201356273290005028725048828125, .0000000000000000000016940658945086006781366450025143625244140625, .00000000000000000000084703294725430033906832250012571812522265625, .000000000000000000000423516473627150169534161250062859062631328125, .0000000000000000000002117582368135750547670806250314295313166015625, .00000000000000000000010587911840678752738354031251571476565830078125, .000000000000000000000052939559203393763691770156257857382829150390625, .0000000000000000000000264697796016968818458850781253928691410670166015625, .0000000000000000000000132348898008484409229425390625196434705335078125, .00000000000000000000000661744490042422046147126953125982173526675390625, .000000000000000000000003308722450212110230735634765625491086783376953125, .00000000000000000000000165436122510605511536781738281252455433916884765625, .000000000000000000000000827180612553027557683908691406251227716958423828125, .0000000000000000000000004135903062765137788419543457031256138584792119140625, .0000000000000000000000002067951531382568894209771728515625306927396059692578125, .000000000000000000000000103397576569128444710488586425781251534636980298828125, .0000000000000000000000000516987882845642223552442932128906257673184901494140625, .0000000000000000000000000258493941422821111776221466064453125383659500747072265625, .0000000000000000000000000129246970711410555888110733032226562519182975003735361328125, .00000000000000000000000000646234853557052779440553665161132812595914875018676806640625, .00000000000000000000000000323117426778526389720



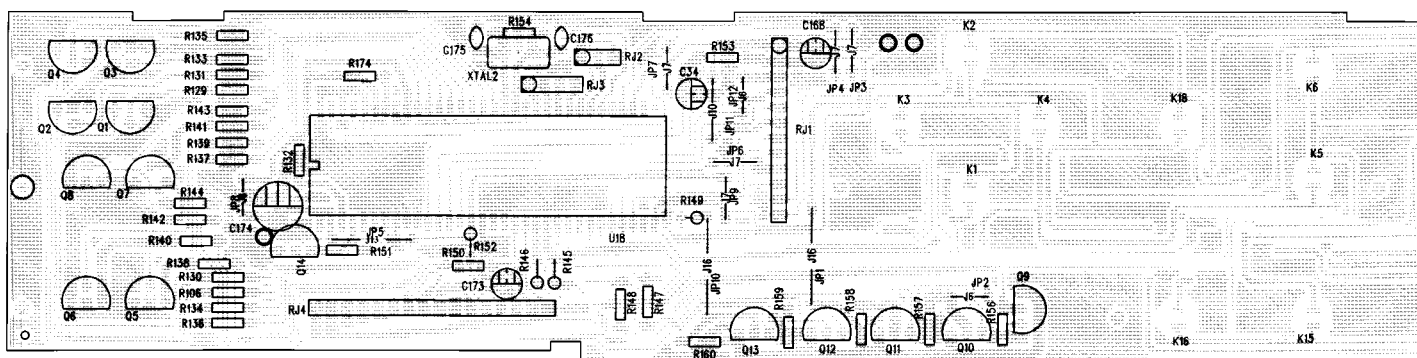
# Main PCB Component Side



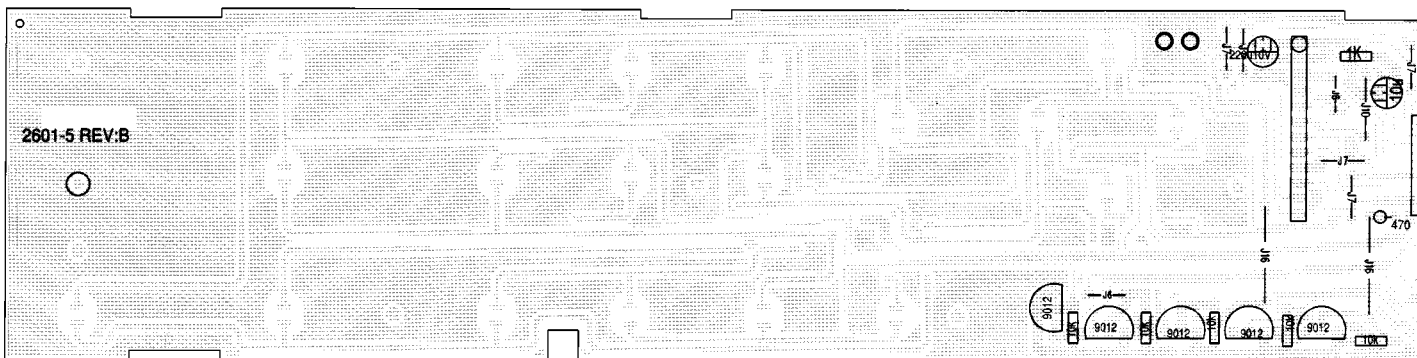


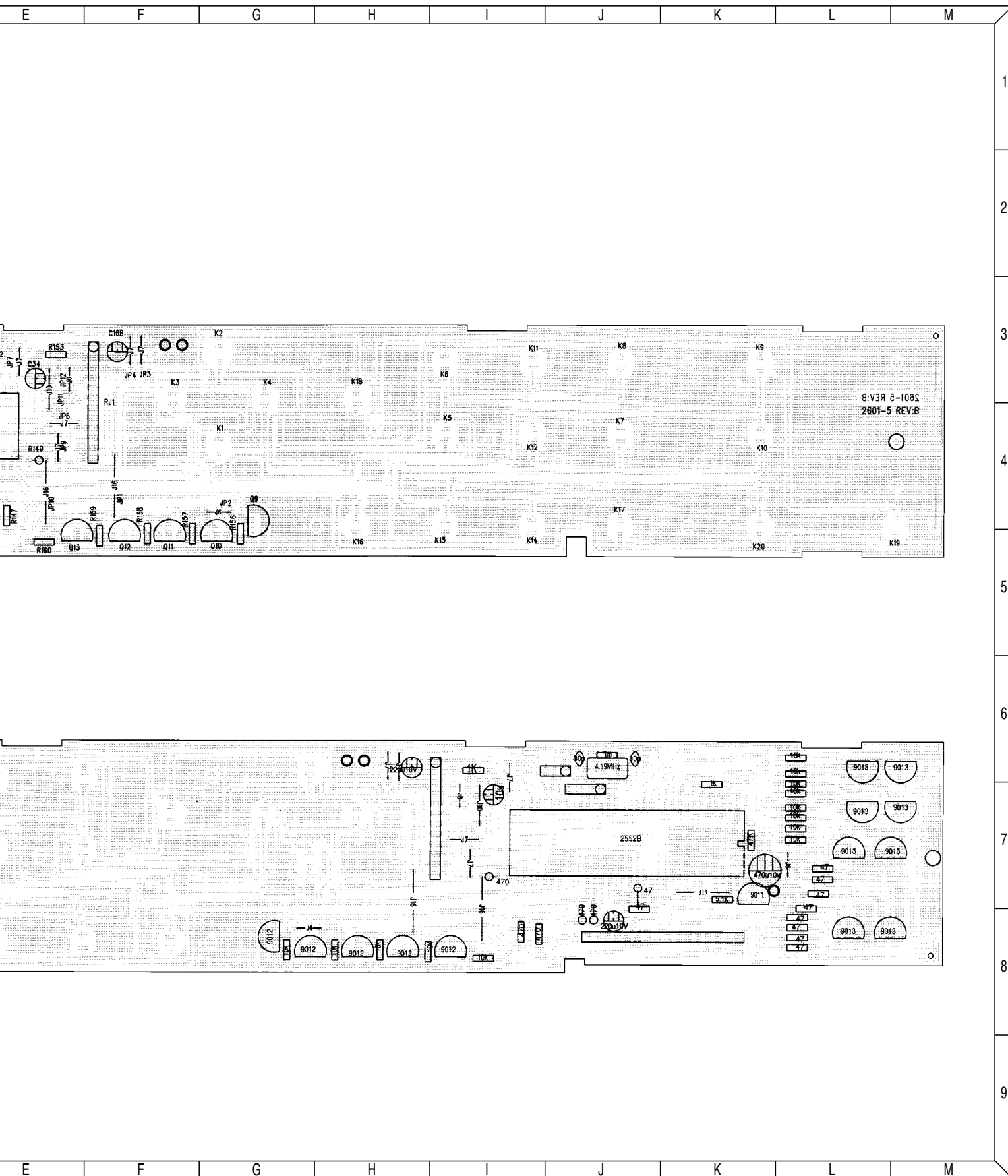


Keyboard PCB Component Side

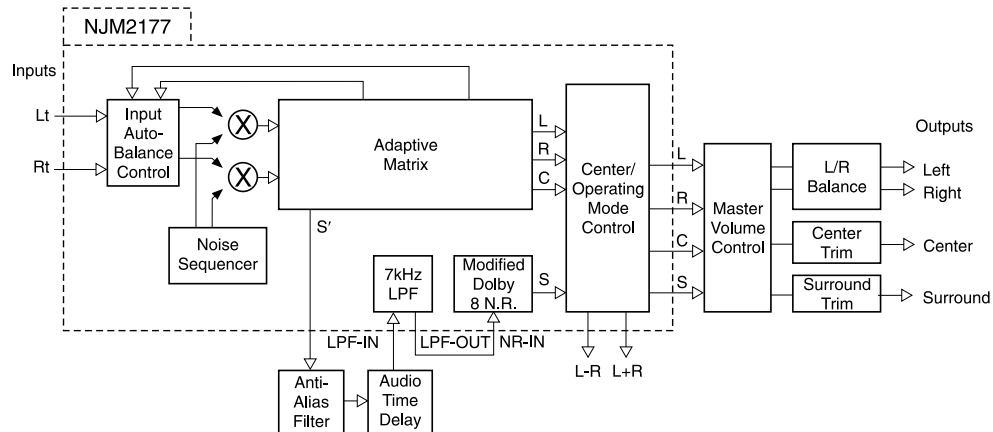
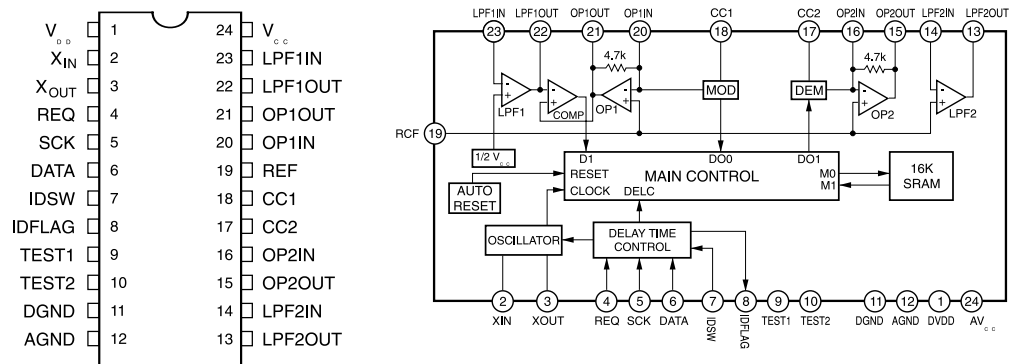
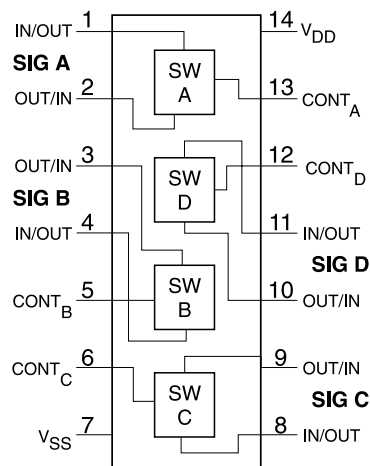
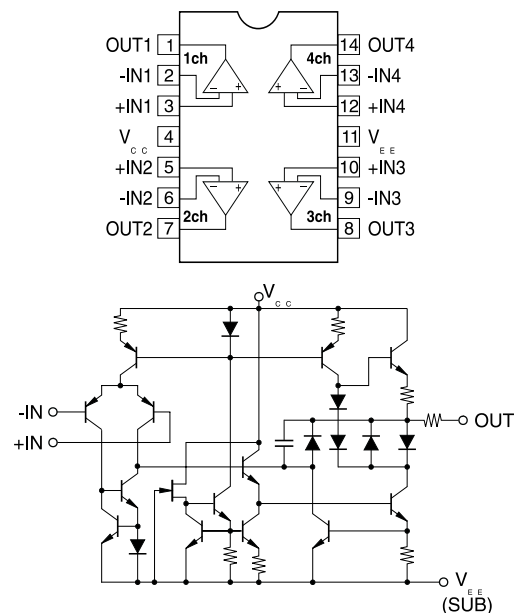


Keyboard PCB Solder Side





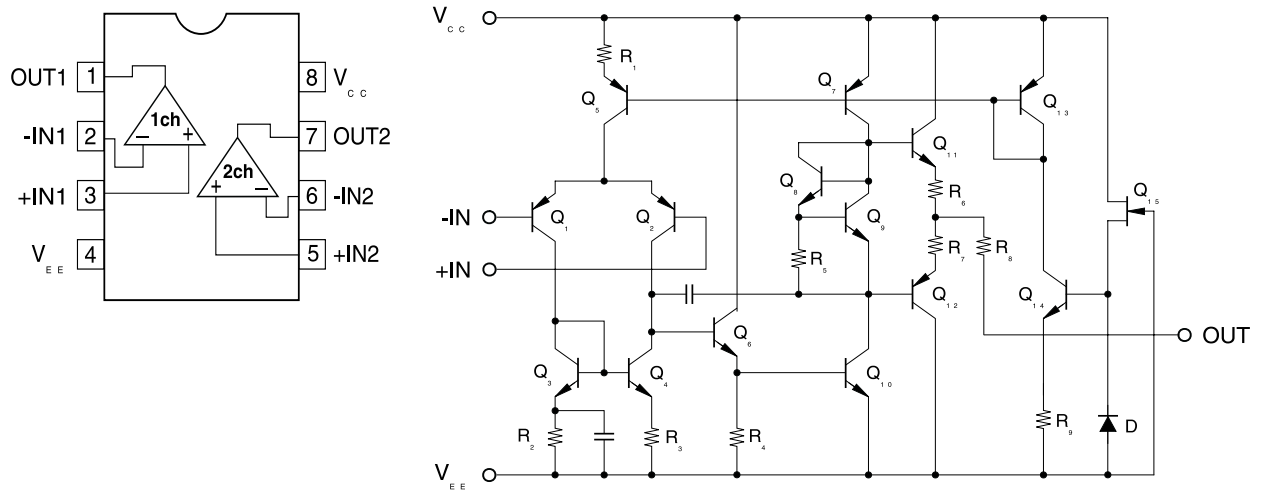
# INTEGRATED CIRCUIT DIAGRAMS

**IC U1 - NJM2177AL Dolby Pro-Logic Surround Decoder**

**IC U2 - NJU9701D/NJU9702D Digital Delay**

**IC U3 - CD 4066D  
QUAD BILATERAL SWITCH**

**IC U4 - BA14741 ROM  
QUAD OP AMP**


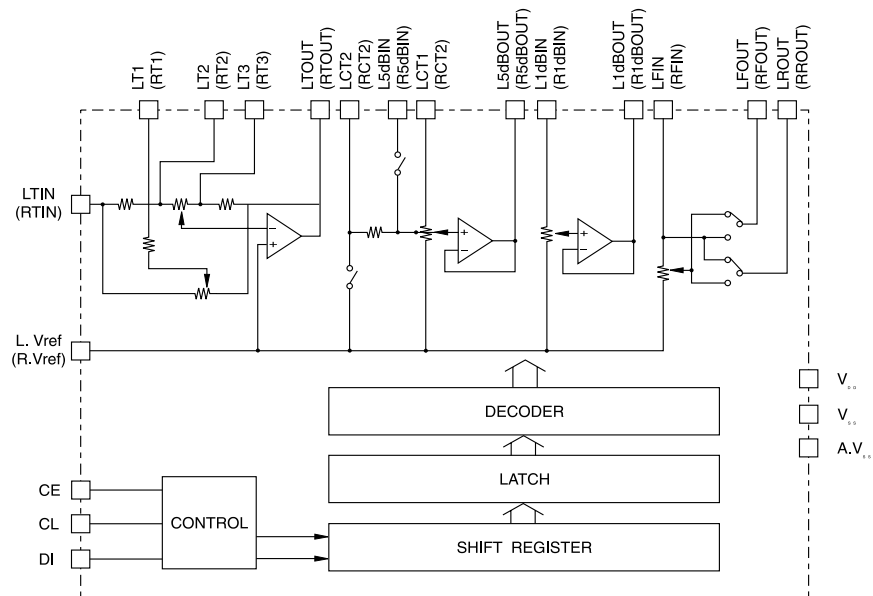


# INTEGRATED CIRCUIT DIAGRAMS

IC U5, U10, U11, U12 - BA4560/4560D DUAL OP-AMP

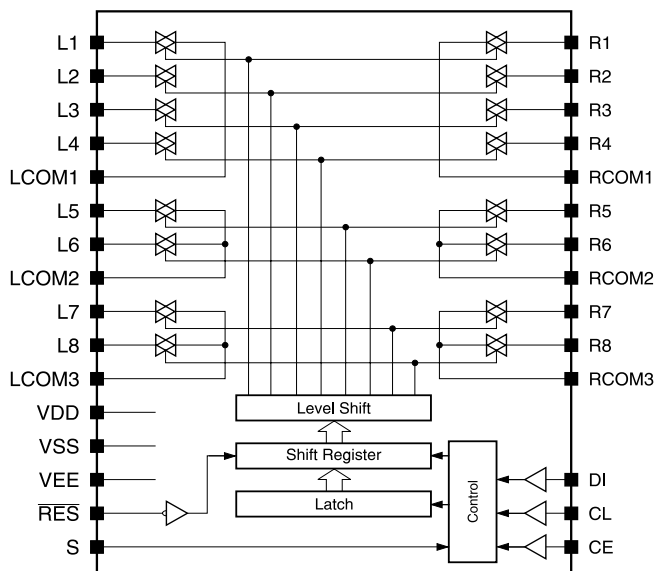
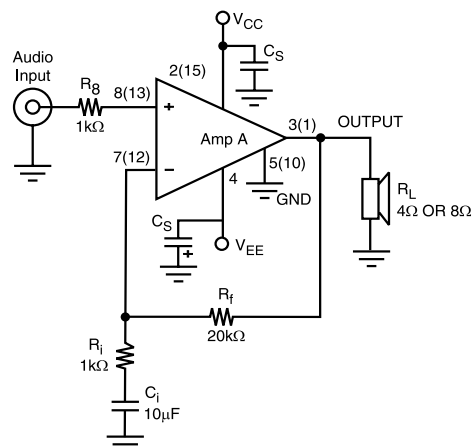
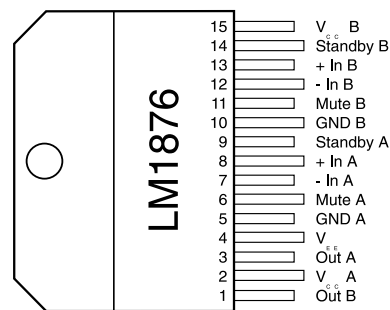
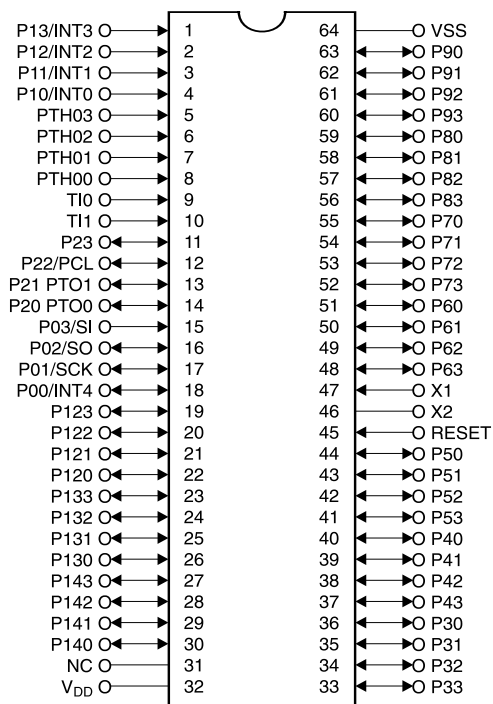
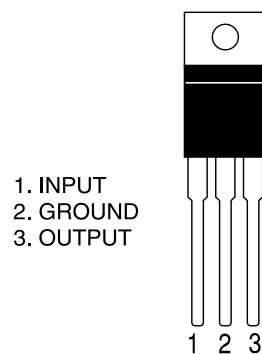


IC U6, U7, U8 - LC7538NM ELECTRONIC VOLUME CONTROL

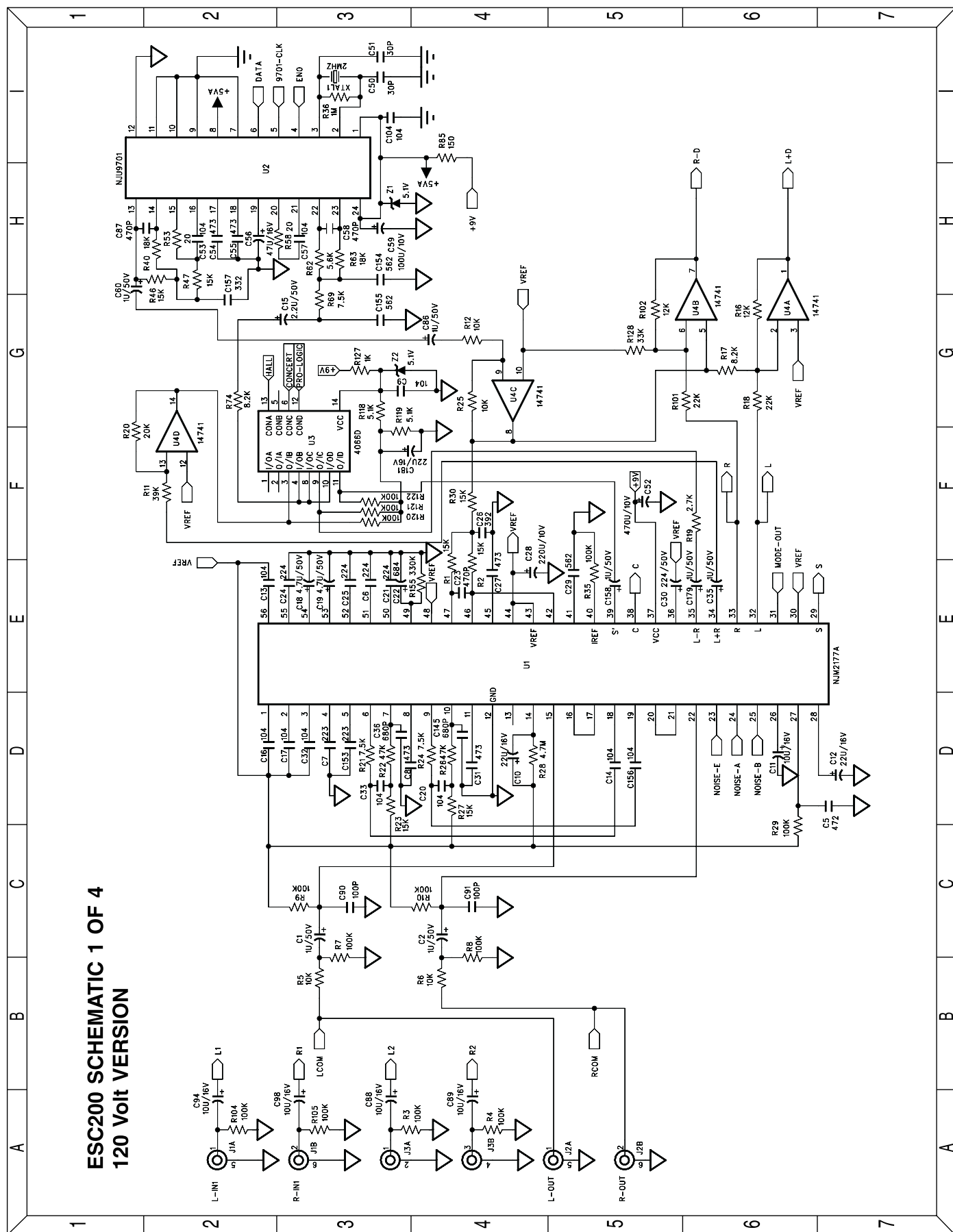


## INTEGRATED CIRCUIT DIAGRAMS

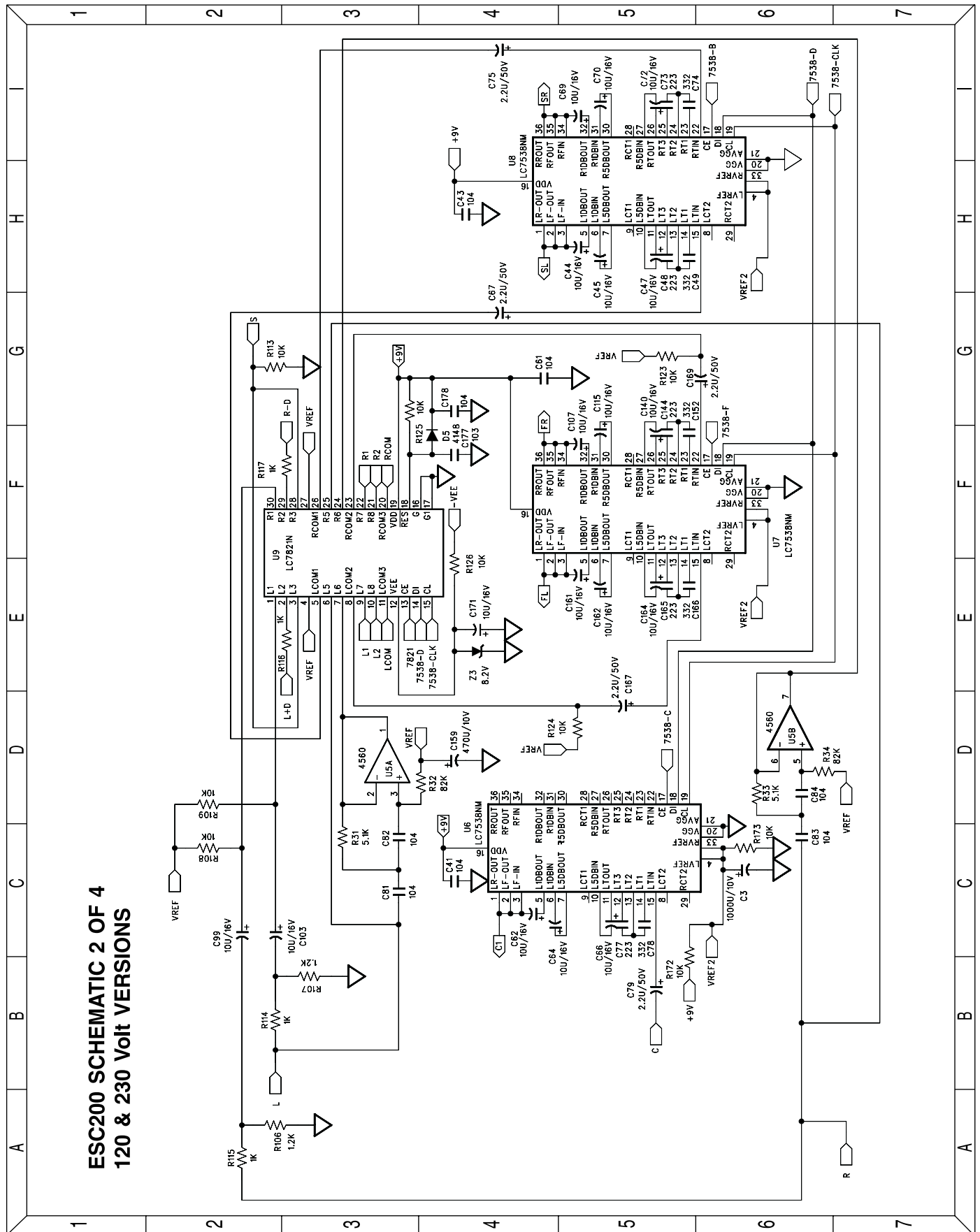
IC U9 - LC7821N ANALOG SWITCH

IC U13, U14, U15 - LM1876TF  
20W POWER AMPIC U18 - UPD75106CW-240 NEC-2552B  
MICROPROCESSORIC U16 - NJM7809FA/7809A  
+9V REGULATORIC U17 - NJM7805FA/7805A  
+5V REGULATOR

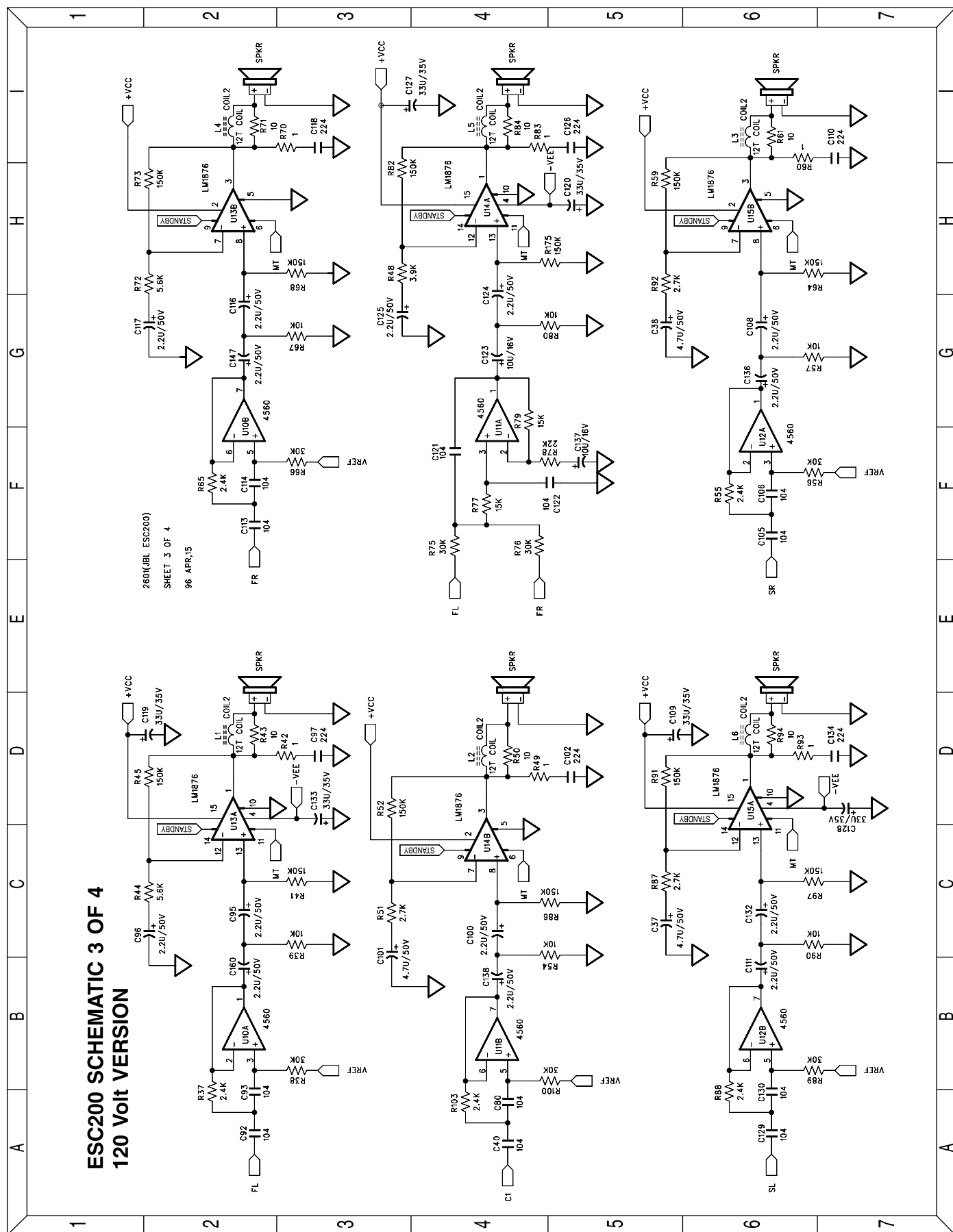
## SCHEMATIC DIAGRAM 1 120V VERSION



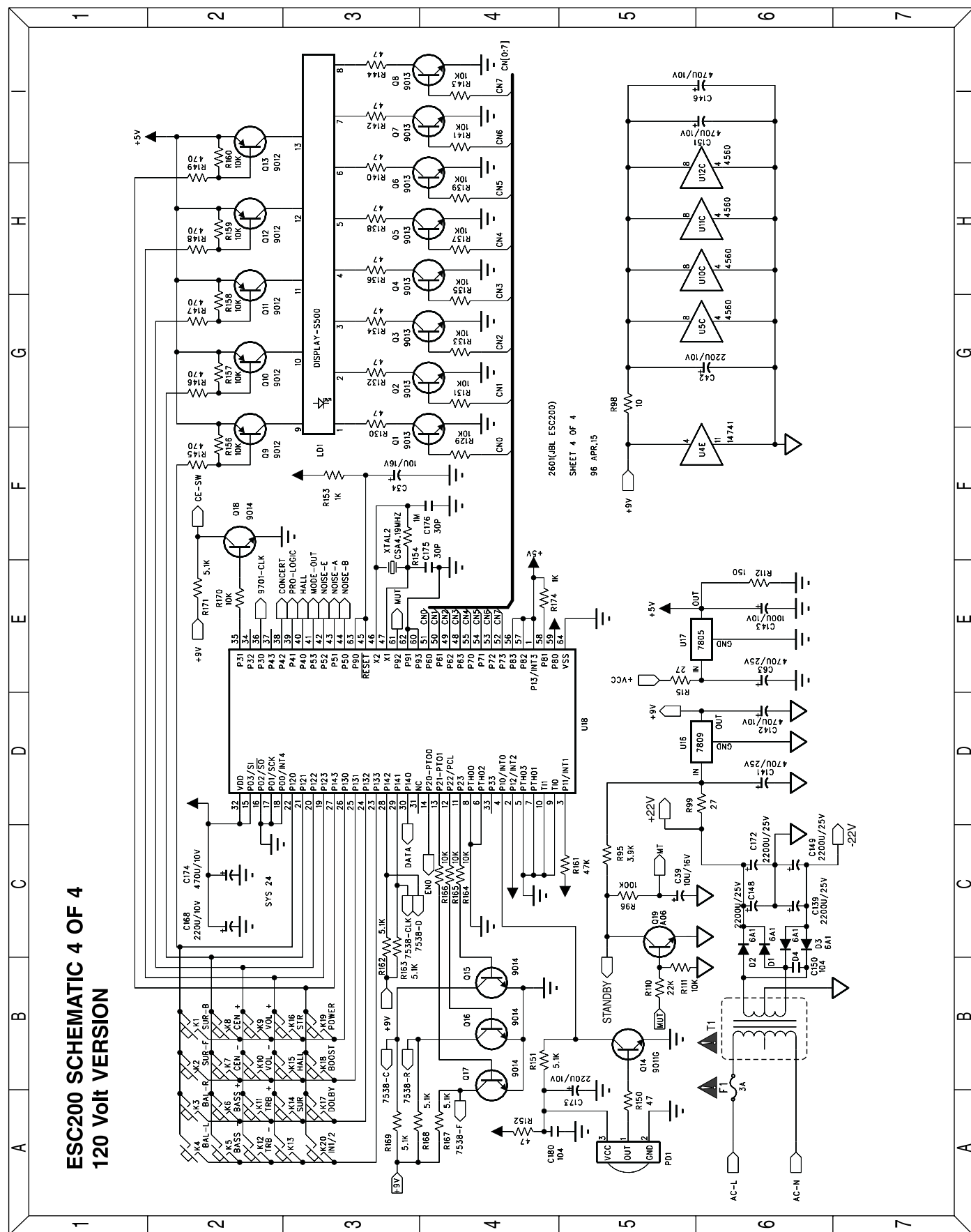
## SCHEMATIC DIAGRAM 2 120V VERSION



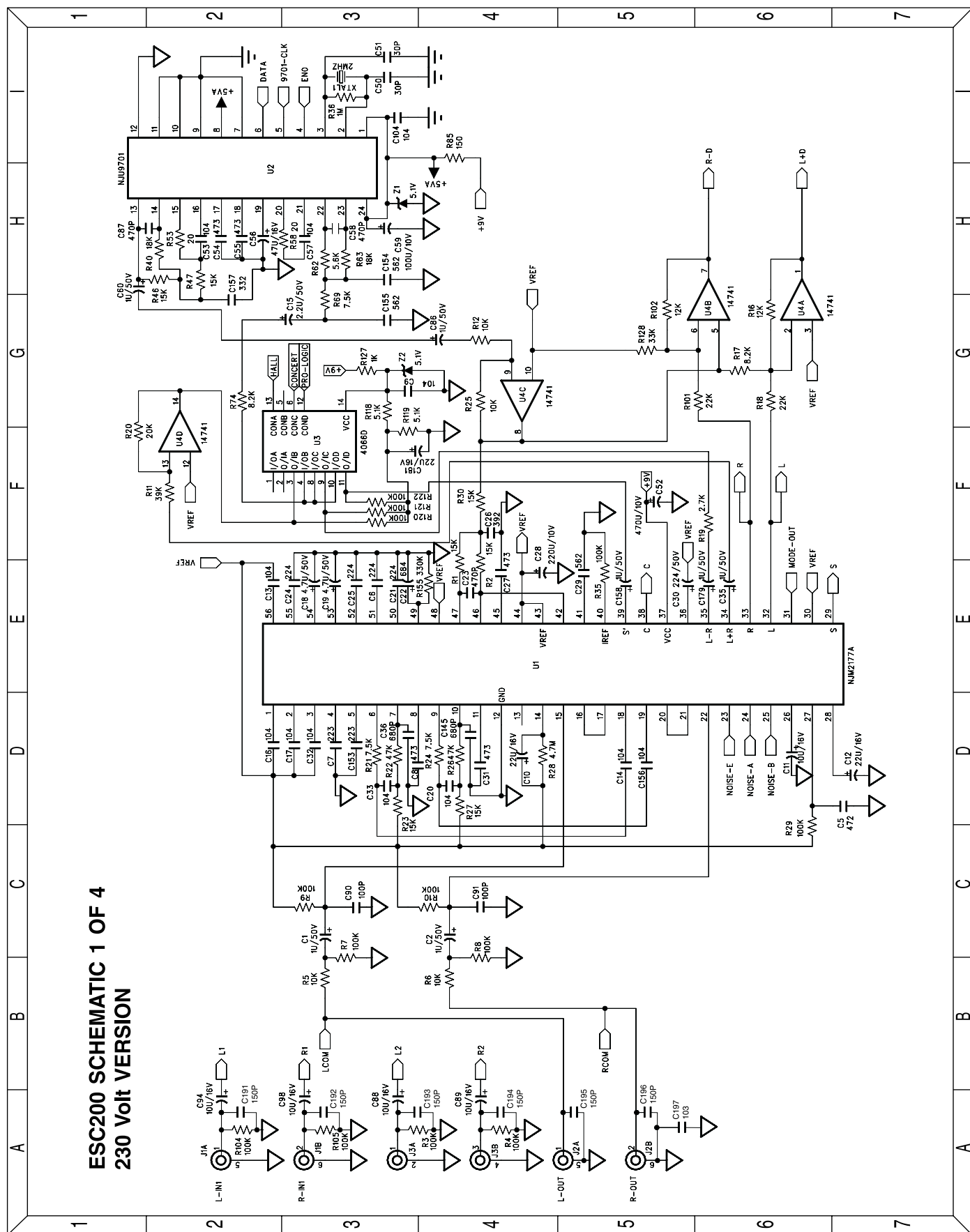
## SCHEMATIC DIAGRAM 3 120V VERSION



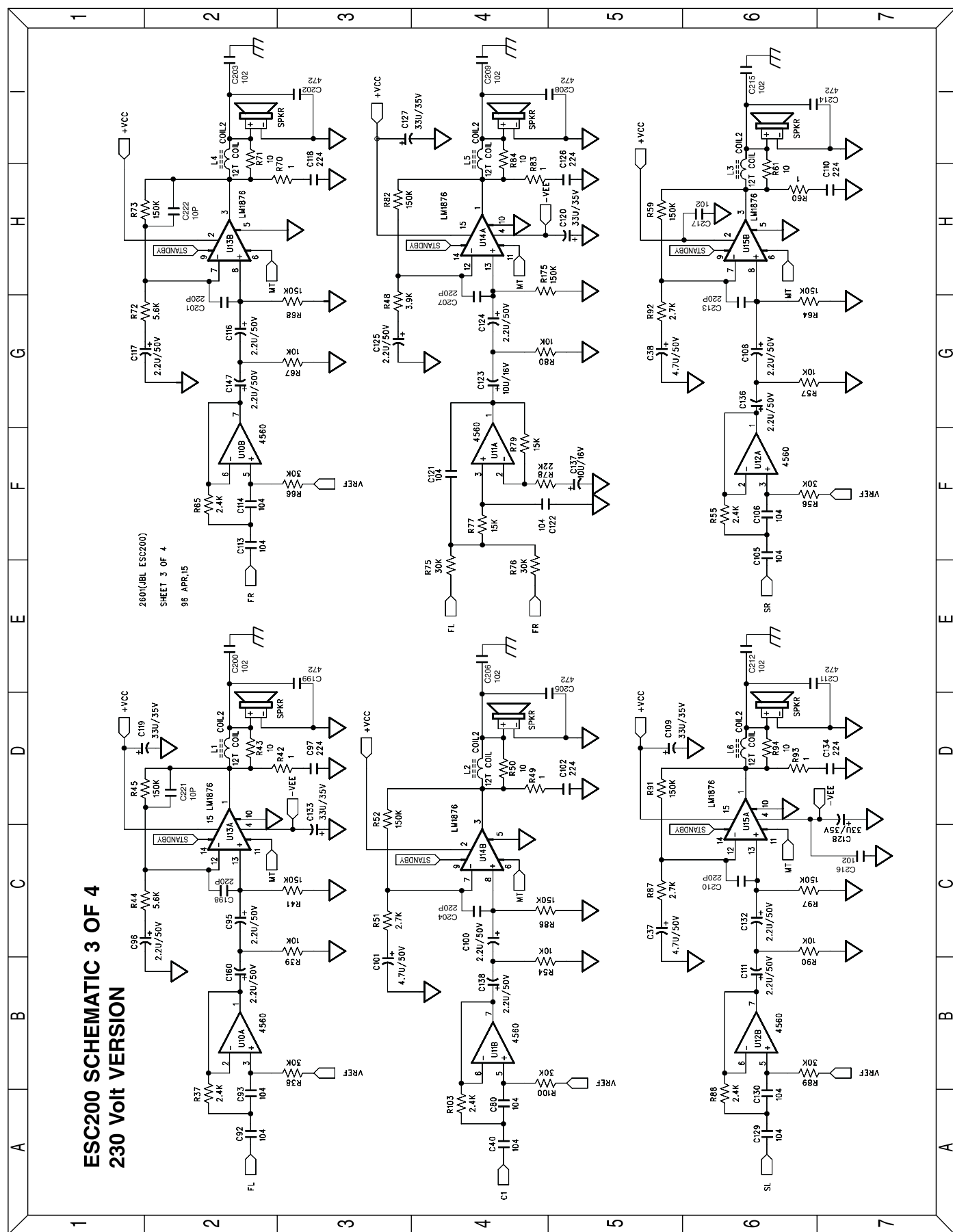
## SCHEMATIC DIAGRAM 4 120V VERSION



## SCHEMATIC DIAGRAM 1 230V VERSION

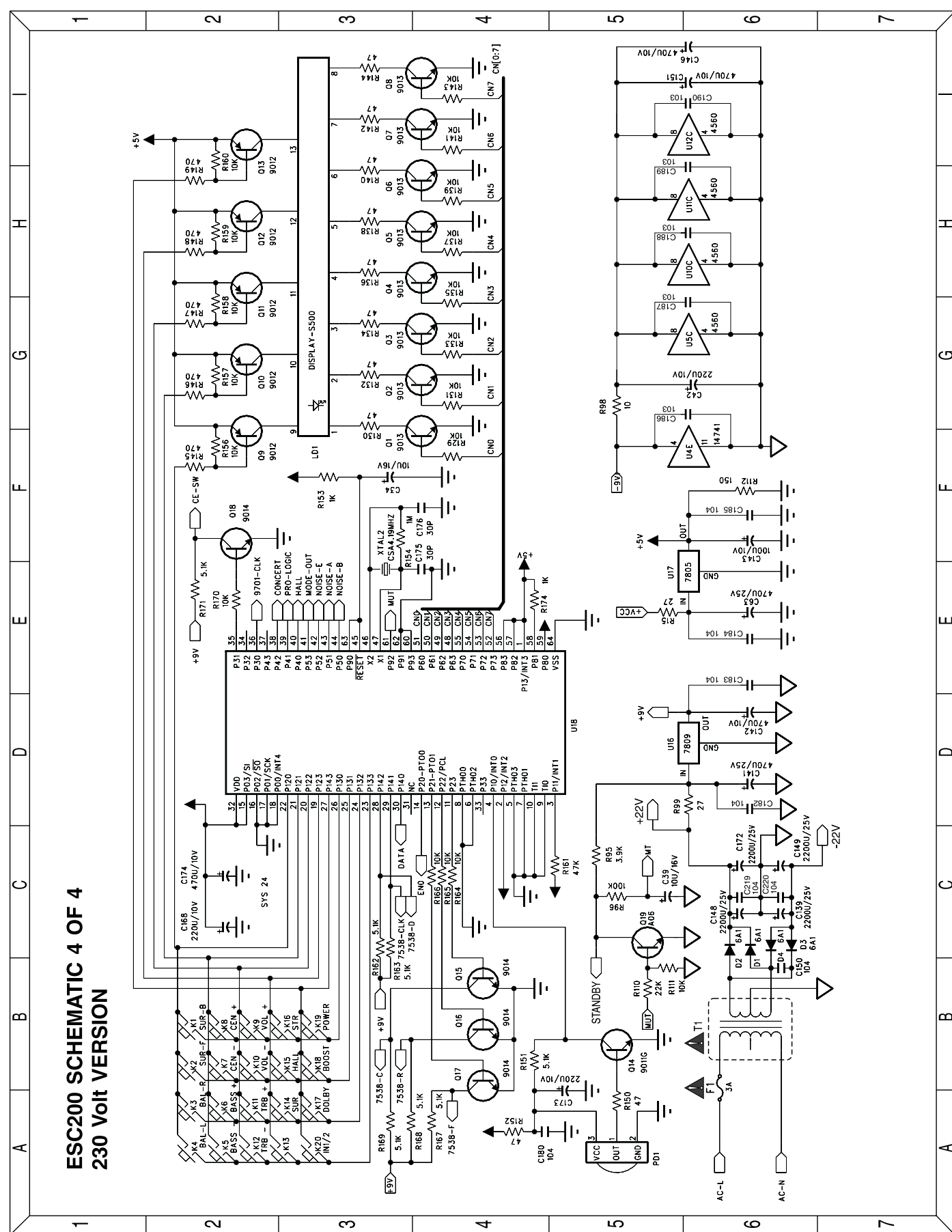


## SCHEMATIC DIAGRAM 3 230V VERSION





## SCHEMATIC DIAGRAM 4 230V VERSION



## ESC200 IC VOLTAGE READINGS

## IC VOLTAGE CHART OF ESC200

CPU(2552B) U18

PIN	VOLT	PIN	VOLT
1	5	33	5
2	5	34	5
3	5	35	5
4	0.1	36	5
5	0	37	0
6	0	38	0
7	0	39	0
8	0	40	5
9	0	41	5
10	0	42	5
11	4.9	43	5
12	4.9	44	5
13	4.9	45	5
14	5	46	2.6
15	5	47	2.5
16	0	48	0
17	0	49	0
18	0	50	0
19	4.1	51	2
20	4.1	52	2
21	4.1	53	2
22	4.1	54	3
23	5	55	3
24	5	56	5
25	5	57	5
26	5	58	5
27	4.1	59	5
28	8.7	60	0
29	0.1	61	5
30	0.1	62	0
31	0	63	5
32	5	64	0

NJM2177A U1

PIN	VOLT	PIN	VOLT
1	3.9	29	4
2	3.9	30	4.1
3	4	31	5.1
4	4.1	32	4
5	4	33	4
6	4.1	34	4
7	4	35	4.1
8	4	36	4.1
9	4	37	9
10	4	38	4.1
11	4	39	4.1
12	0	40	1.4
13	8.2	41	4
14	3.7	42	4.1
15	4	43	4.1
16	4	44	4.1
17	4	45	4.1
18	4	46	4.1
19	4	47	4.1
20	4	48	4.1
21	4	49	0
22	4	50	4
23	5	51	4
24	5	52	4
25	5	53	4
26	4.1	54	4
27	4.1	55	4
28	2.7	56	4

14741 U4

PIN	VOLT	PIN	VOLT
1	4.1	8	4.1
2	4.1	9	4.1
3	4.1	10	4.1
4	9	11	0
5	4.1	12	4.1
6	4.1	13	4.1
7	4.1	14	4.1

NJU9701\NJU9702 U2

PIN	VOLT	PIN	VOLT
1	5.1	13	2.6
2	2.2	14	2.6
3	2.4	15	2.6
4	5	16	2.6
5	5	17	0.7
6	0.1	18	0.7
7	0	19	2.6
8	5.1	20	2.6
9	0	21	2.6
10	0	22	2.6
11	0	23	2.6
12	0	24	5.1

LC7821 U9

PIN	VOLT	PIN	VOLT
1	4.1	16	0
2	4.1	17	0
3	4	18	9
4	4.1	19	9
5	4	20	0
6	4	21	0.3
7	4.1	22	0
8	4.1	23	4.1
9	0	24	4.1
10	0.3	25	4
11	0	26	4
12	-8.2	27	4.1
13	0	28	4
14	8.7	29	4.1
15	0.1	30	4.1

4560 U5,U11-12

PIN	VOLT	PIN	VOLT
1	4.1	5	4.1
2	4.1	6	4.1
3	4.1	7	4.1
4	0	8	9

4066D U3

PIN	VOLT	PIN	VOLT
1	1.3	8	2.6
2	1.4	9	2.6
3	4.1	10	2.6
4	2.6	11	2.6
5	0	12	0
6	5	13	5.1
7	0	14	5.1

LC7538 U6-8

PIN	VOLT	PIN	VOLT
1	4.5	19	0.1
2	4.5	20	0
3	4.5	21	0
4	4.6	22	0
5	4.6	23	1.4
6	4.6	24	0
7	4.6	25	0
8	4.6	26	0
9	0.2	27	4.6
10	4.6	28	1.4
11	4.6	29	4.6
12	4.6	30	8
13	4.6	31	4.6
14	4.6	32	8
15	4.6	33	4.6
16	9	34	4.6
17	0	35	4.6
18	8.6	36	4.6

LM1876 U13-15

PIN	VOLT	PIN	VOLT
1	0	9	0.1
2	22	10	0
3	0	11	0.1
4	-22	12	0
5	0	13	0
6	0.1	14	0.1
7	0	15	22
8	0		